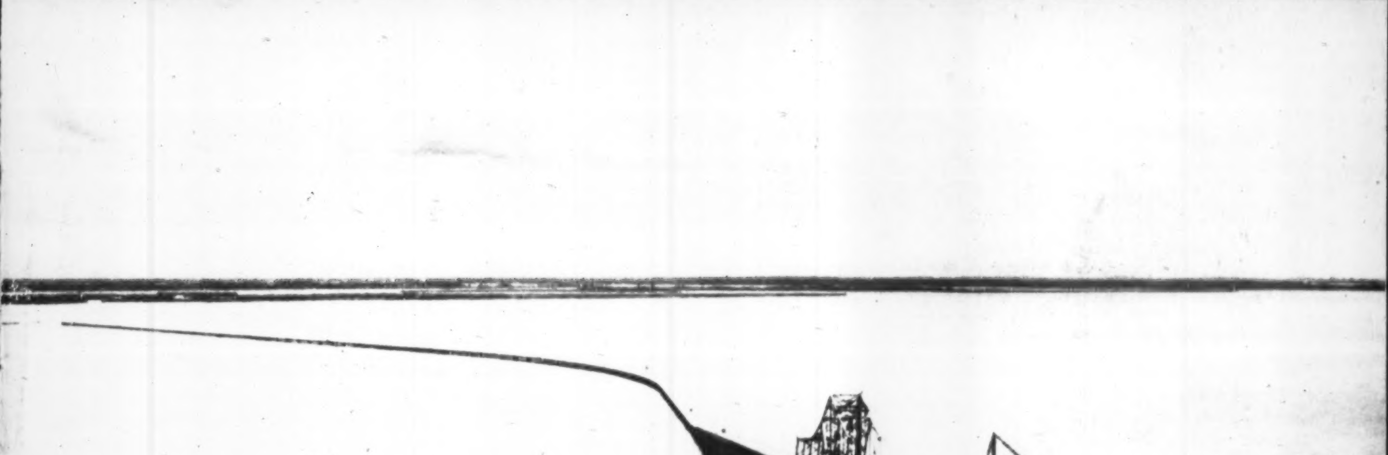
ENGINEERING NEWS-RECORD

EIGHTIETH YEAR OF PUBLICATION



A McGRAW-HILL PUBLICATION

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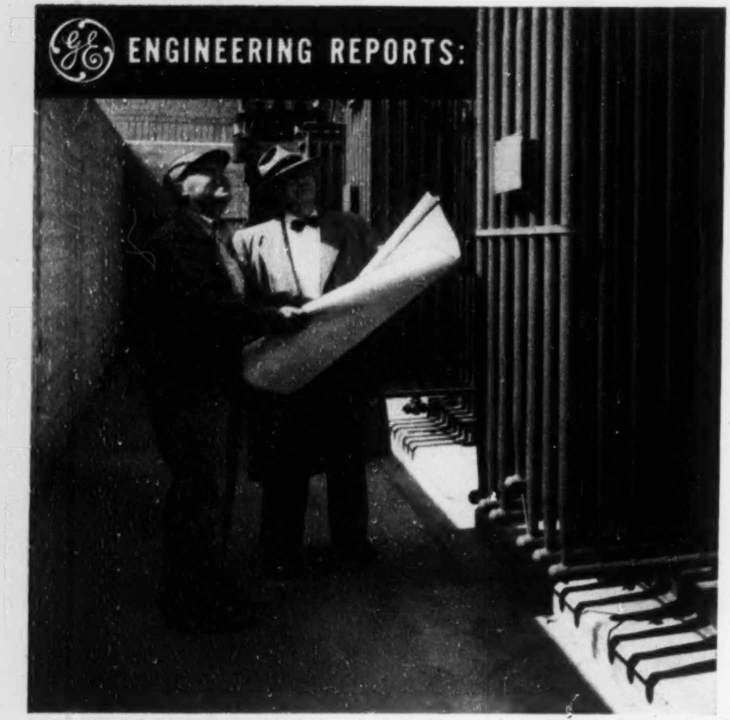
ENGINEERING REPORTS:



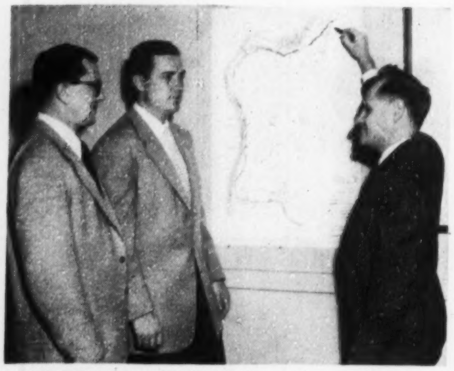
PROJECT CO-ORDINATION of electrical equipment for new pumping stations was handled by D. H. Bixby (right) of G.E.'s Louisville office, working with J. C. Jones, field supt., Central Contracting Co., and Marine Electric Co.

G-E engineering service helps speed Louisville flood control

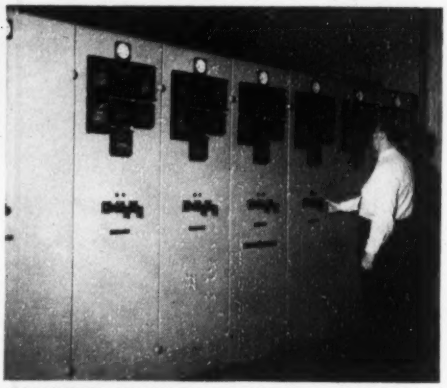
Expedites construction of 4 pumping stations by prompt delivery of all G-E equipment

In the $24,475,000 Louisville flood control project of the U.S. Army Corps of Engineers, General Electric project co-ordination service, in addition to application engineering, played an important part Through this service, all G-E power distribution equipment ordered for four of the project's pumping stations was delivered either on or ahead of schedule. This helped the electrical contractors, Marine Electric Co., and the general contractors, Central Contracting Co., to work at top efficiency, expedited construction, and earned the praise of both the Army engineers and contractors.

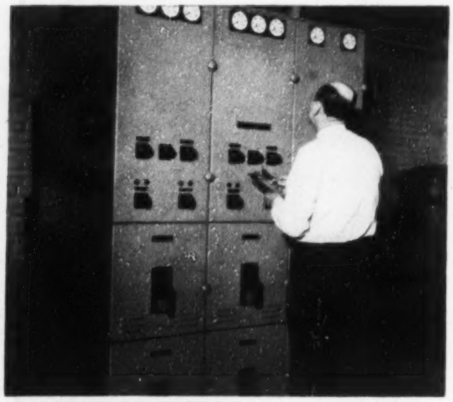
G-E equipment, backed by G-E engineering services, can pay off on *your* heavy construction projects. Learn how by contacting your nearest G-E Apparatus Sales Office. General Electric Company, Schenectady 5, New York. 664-32



ENGINEERING ASSISTANCE on the project was made available to U.S. Army engineers through F. G. Perkins (center), G-E sales engineer.



COMPLETE CONTROL of Shawnee station is provided by G-E 2400-v metal-clad switchgear consisting of 6 circuit breaker feeder sections.



INCREASED PROTECTION at the project's 34th St. pumping station is provided by 480-v G-E switchgear with 6 drawout air circuit breakers.

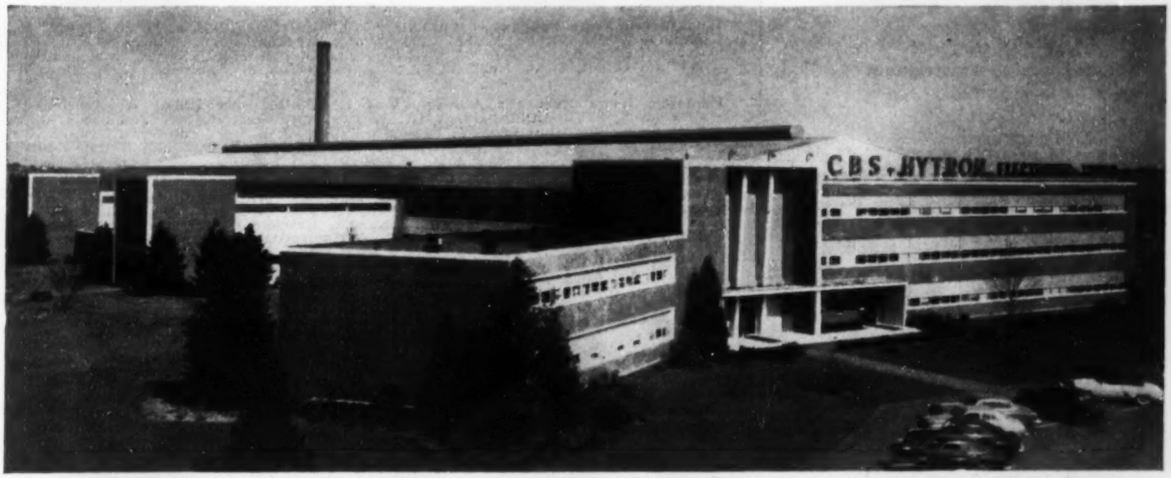
Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

ON THE NEWS FRONT WITH STRUCTURAL STEEL

Utility Administration Building

Connecticut Light and Power Company's administration building on Wilbur Cross Parkway at Berlin, Conn., is a two-story brick structure of modified colonial design. The T-shaped building, built on a framework of Bethlehem Structural Shapes, has a total floor area of 98,000 sq ft. At the junction of the "T," a tower, lighted at night, is a new area landmark. A snow-melting system has been installed in main-entrance sidewalks. A two-story service building is connected to the administration building by a tunnel. *Architect:* Douglas Orr, New Haven, Conn.; *Contractor:* W. J. Megin, Inc., Naugatuck, Conn.; *Steel Erector:* Berlin Construction Co., Berlin, Conn.; *Steel Fabricator:* Bethlehem Fabricators, Inc., Bethlehem, Pa.



Electronic-Tube Plant

Also in New England, at Danvers, Mass., is the electronic-tube plant and main office of CBS-Hytron, a division of Columbia Broadcasting System, Inc. The building, containing 1000 tons of Bethlehem Structural Steel, has modern office wings faced with red brick, and a production area of 200,000 sq ft. The main manufacturing floor is 480 ft by 100 ft and is entirely free of supporting columns. The need for locker rooms for the plant's 2500 employees has been eliminated by the use of two employee entrance stair towers and passage-way tubes, the latter serving as convenient and functional clothing-storage areas. *Architectural Engineers:* R. P. Systems, Inc., Beverly, Mass.; *Contractor:* Leslie R. Porter, Beverly; *Steel Fabricator:* A. O. Wilson Structural Co., Cambridge, Mass.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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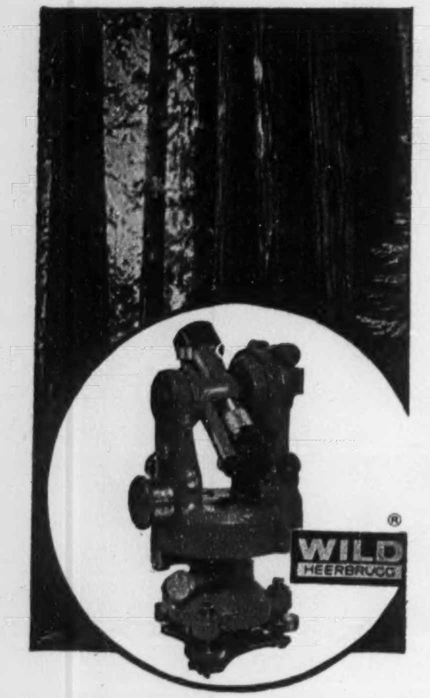
BETHLEHEM STEEL



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Robert F. Boger

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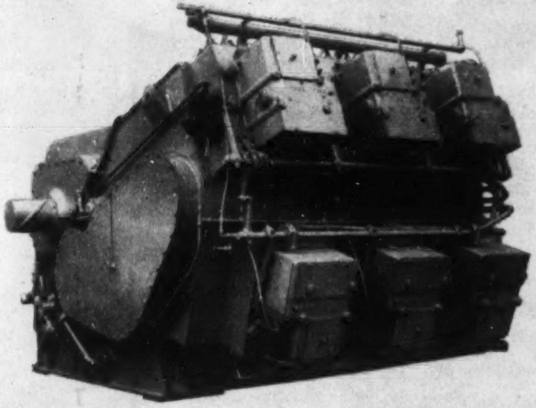
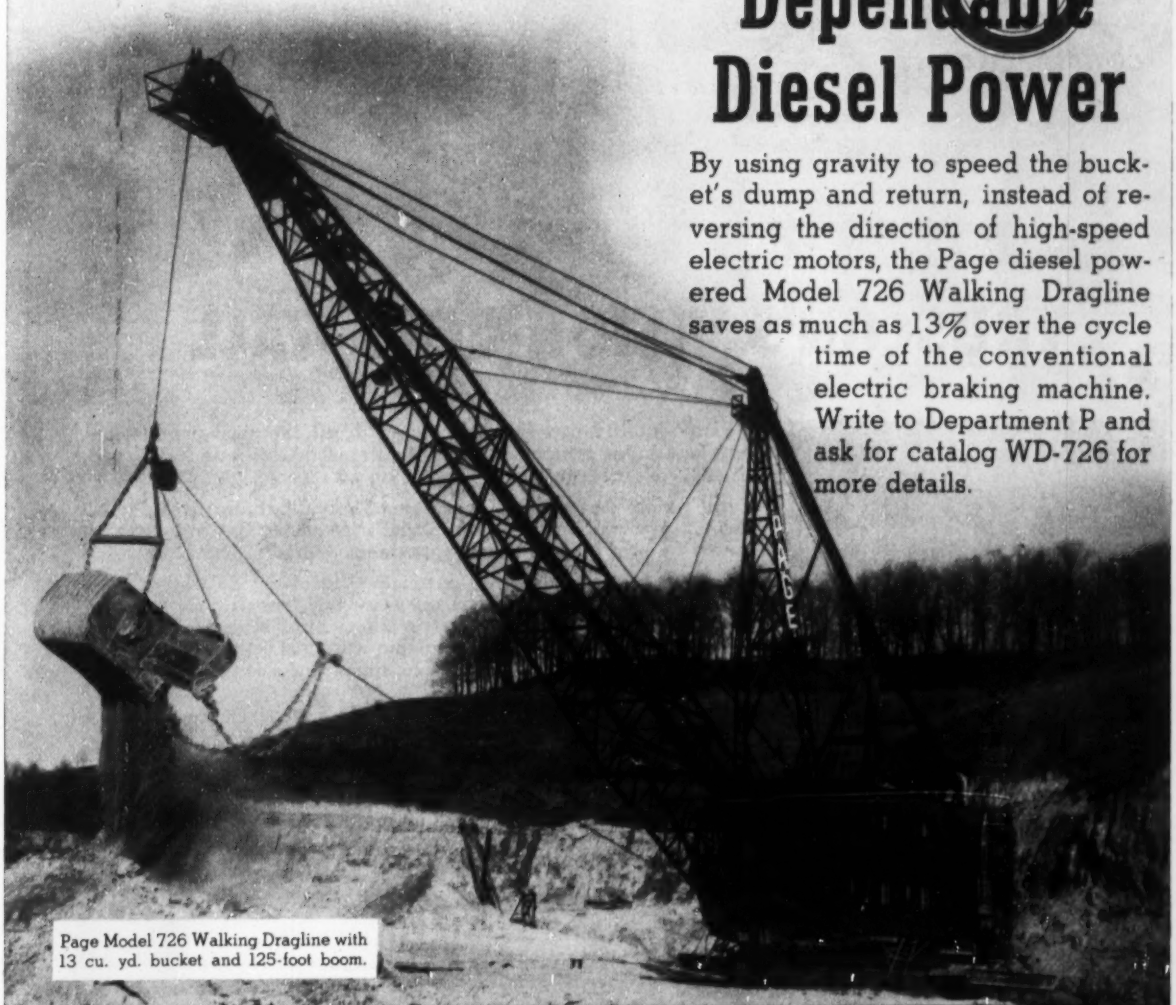


Page Engineering Company custom builds the new V-type, Horizontal Diesel Engine, shown at left, in order to allow the use of larger, more economical, draglines of capacities up to 20 cu. yds. Like the time-tested Page inline diesel, the V-type takes advantage of medium speed, parts interchangeability and complete accessibility of all moving parts to insure economy of operation and low maintenance costs.

Reduce Cycle Time with—Page Dependable Diesel Power



By using gravity to speed the bucket's dump and return, instead of reversing the direction of high-speed electric motors, the Page diesel powered Model 726 Walking Dragline saves as much as 13% over the cycle time of the conventional electric braking machine. Write to Department P and ask for catalog WD-726 for more details.

Page Model 726 Walking Dragline with 13 cu. yd. bucket and 125-foot boom.

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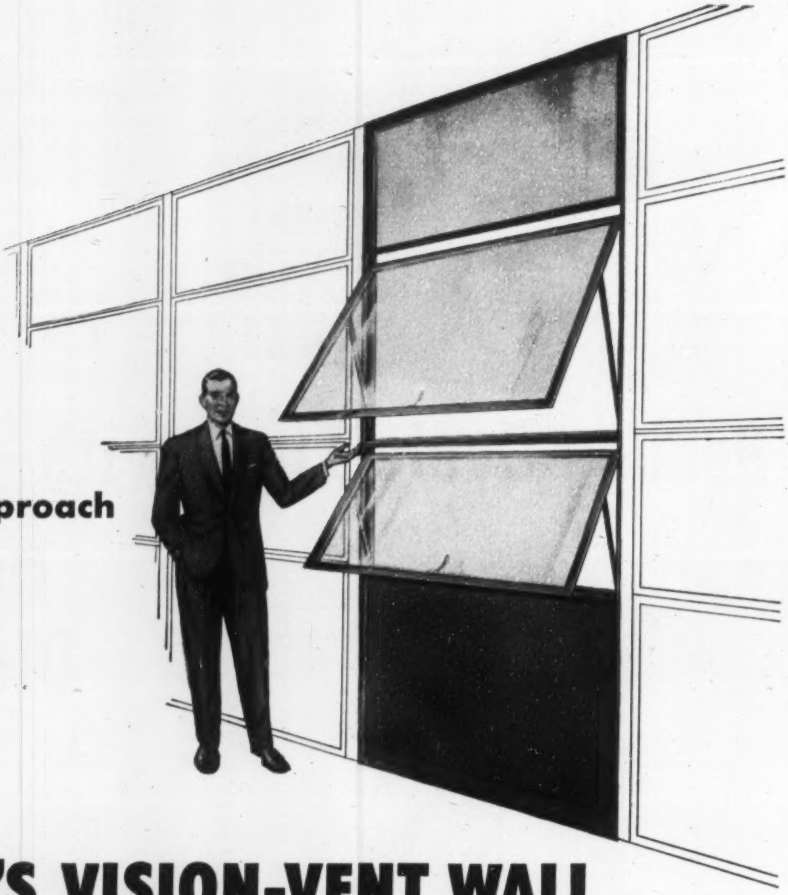
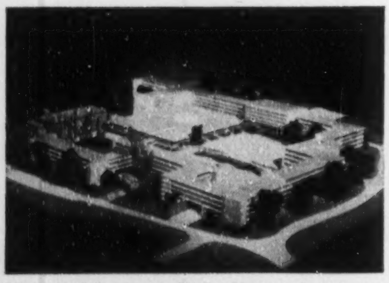


An exciting new approach to fast, economical construction...

TRUSCON'S VISION-VENT WALL



Illustrated is a recent Vision-Vent application at Clemson Barracks, Clemson College, S. C. Lyles, Bissett, Carlisle & Wolff, architects; Daniel Construction Co., contractors. Vision-Vent also is being used for a chain of hospitals.

Vision-Vent is a new building unit with all the mass-production and installation economies of standard steel windows. It is designed to enclose entire walls.

Each Vision-Vent unit is complete. Section includes fixed lights, awning-type ventilators, and insulated steel panels. Elements may be varied to meet functional and appearance requirements.

Insulated panels—in colored porcelain enamel or in stainless steel—have a "U" factor of .197, equivalent to that of an ordinary masonry spandrel wall. Vision-Vent panels retain interior heat. They provide for efficient air-conditioning. Minimum wall thickness—less than 1½"—provides extra square feet of floor space. Light weight is reflected in structural savings.

Erection is done from inside at an average rate of a floor a day. Vision-Vent is weathertight.

This exciting new Truscon development is recommended for use in the design of all types of single and multi-story buildings. Truscon window engineers will be glad to study your requirements, and develop design details and costs. More details in Sweet's, or write:

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a name you can **build** on

B.F.Goodrich

Tires work at lower cost per mile, construction company reports

PAYLOADS UP TO 25 TONS are carried by B. F. Goodrich Universals on this Kansas City bridge approach job. Wedge-shaped cleats defy sideslipping, give traction in reverse as well as forward.

The Clarkson Construction Company scraper above is at work on the south approach to a new bridge over the Missouri River. The bridge will connect Kansas City with North Kansas City, is typical of the heavy construction work done by this firm's 100 units in the states surrounding Missouri.

Clarkson uses B. F. Goodrich tires for this rugged service, prefers them because they cut costs per mile.

All-Nylon cord body

Universal tires, sizes 12.00 and larger, are built with an *all-nylon* cord body that cuts costs because it withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks.

Under the tread is the B. F. Goodrich shock shield. Layers of strong nylon cords stretch together to protect the tire body from shocks and bruises. You save 4 ways: (1) more recappable tires and more hours of service per recap (2) more original hours of service (3) increased bruise resistance (4) less danger of tread separation. You pay nothing extra for the patented BFG shock shield.

See *all-nylon* tires at your nearby B. F. Goodrich retailer's (smaller sizes in *all-nylon* or rayon construction). The address is listed under Tires in the Yellow Pages of your phone book. Or write: *The B. F. Goodrich Co., Tire & Equipment Division, Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS
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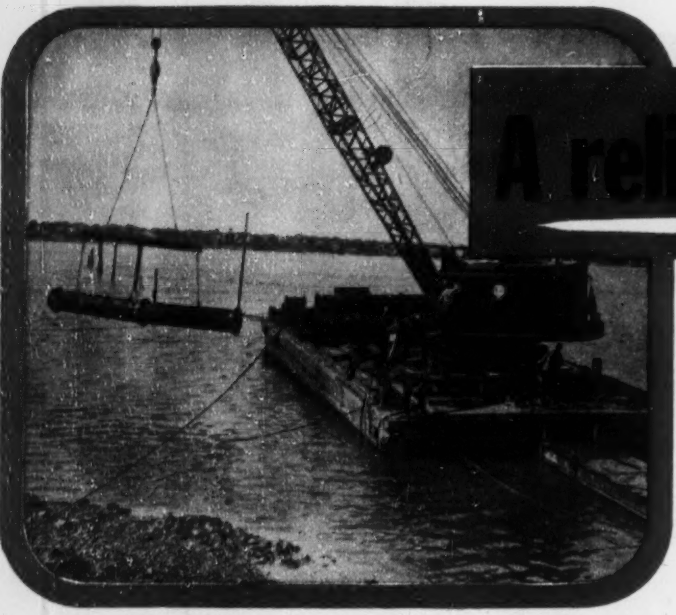
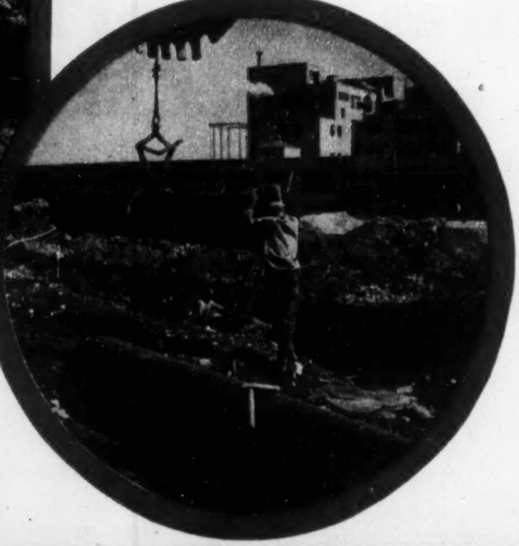


A reliable material

Where installations are planned for long-term service to assure low cost per service year, engineers rely on cast iron pipe as a dependable and adaptable material. Consequently, it is specified for a wide variety of applications, both utility and industrial, including water supply, gas, sewerage, fire protection, power plants, oil refineries, process industries and many forms of special construction. Long life and low maintenance cost are *proved* results of the high beam-strength, compressive-strength, shock-strength and effective resistance to corrosion of cast iron pipe. For information write: Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3, Ill.

Installing 30-inch cast iron mechanical joint pipe for outfall sewer at East Providence, R. I.

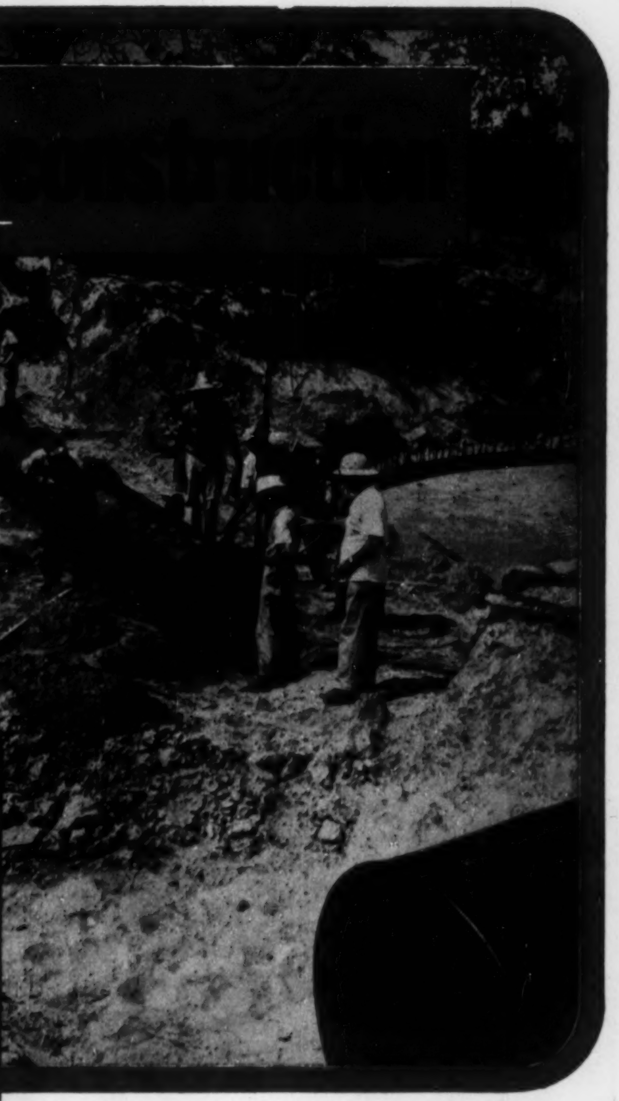


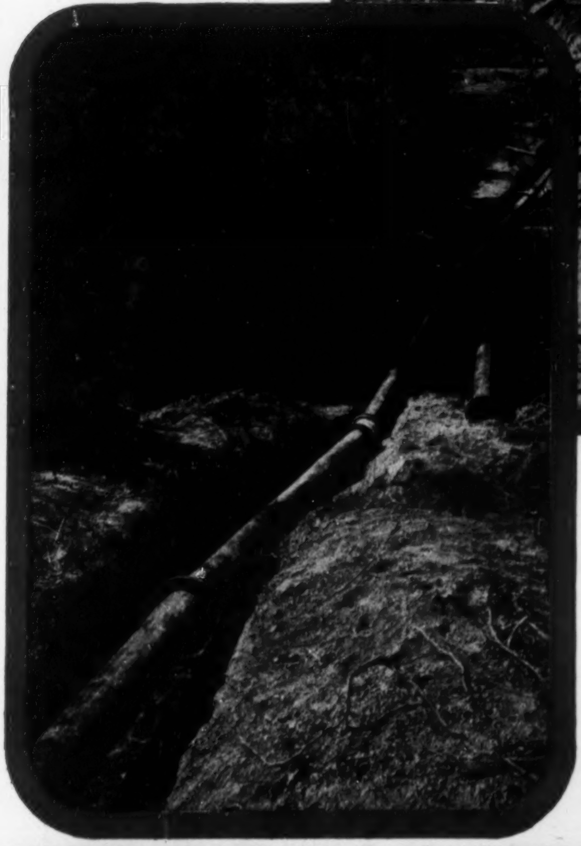
(above)
Laying 16-inch cast iron pipe alongside railroad tracks at Ft. Lauderdale, Florida.

(at right)
Cast iron pipe being installed for large process industry plant in Chicago.

CAST IRON PIPE

for permanent construction

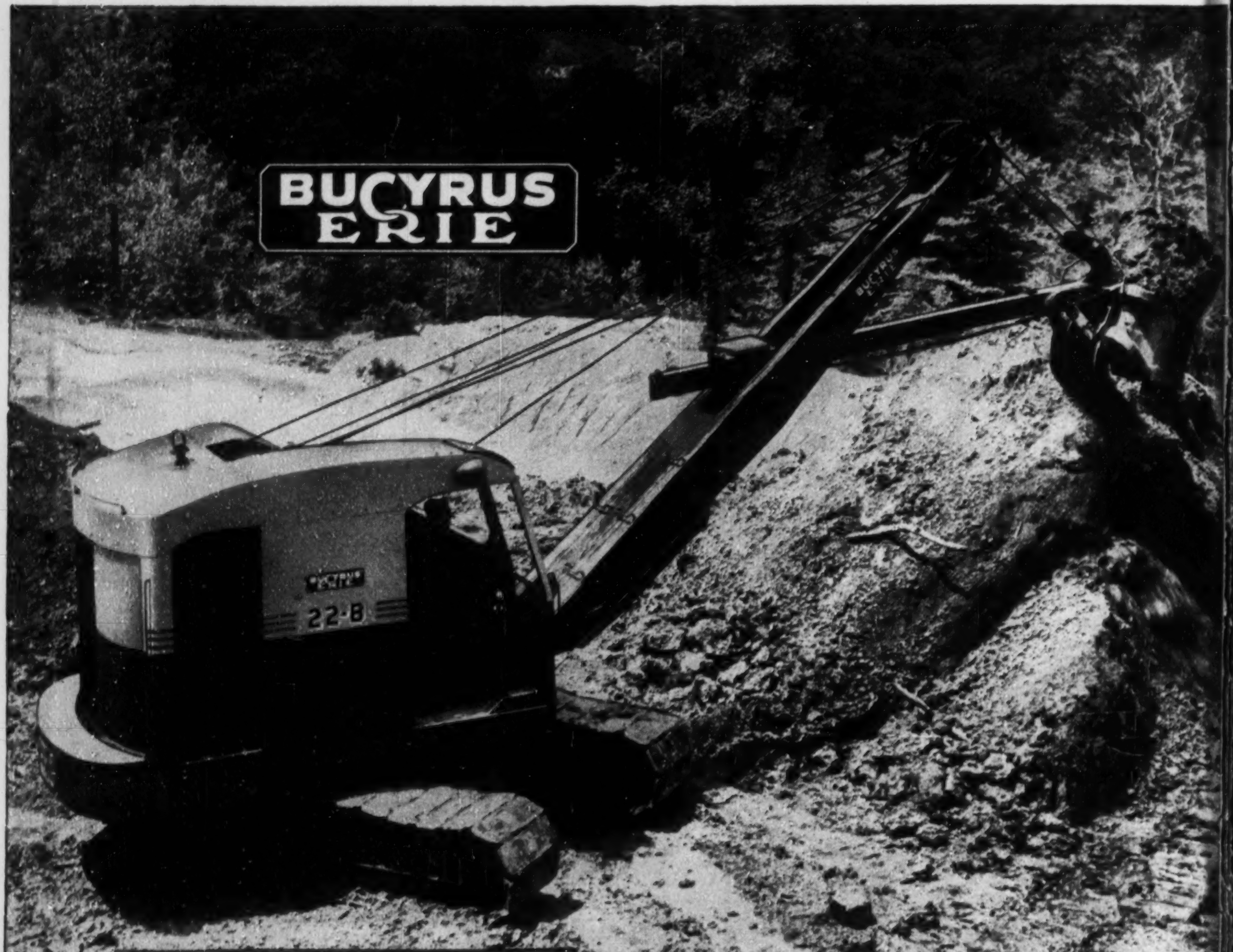




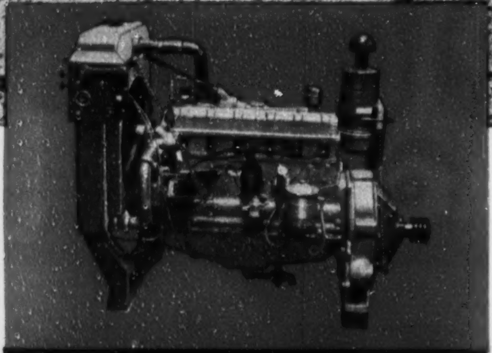
(above)
Installing 30-inch cast iron pipe for sewage treatment plant at Panama City, Florida.

(at left)
Eight-inch mechanical joint cast iron pipe installed under difficult conditions to carry coal mine water at Sumiton, Ala.

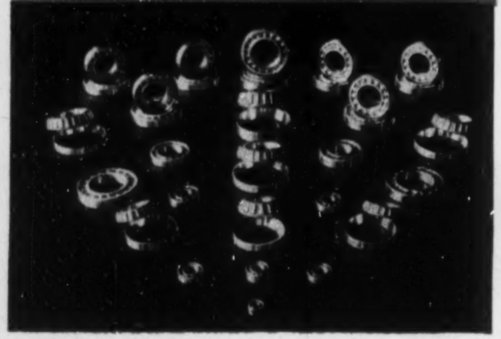
SERVES FOR CENTURIES...



Heaped loads like this are the rule with Bucyrus-Erie excavators because full power is put to work at the dipper — none is wasted swinging useless deadweight.



Power Is Right To Begin With because power unit has operating characteristics designed to meet the needs of excavating and lifting service, and is matched to the rated capacity of the machine in which it is used. Special "tailoring" of the engine provides better fuel and air mixture for increased efficiency . . . less pulldown under sudden loads . . . more lugging power at slower speeds . . . ability to regain speed quickly after slow-downs.



Power Rides To Work Efficiently with minimum loss from friction and inertia. Most power-transmitting parts used in the digging cycle ride on anti-friction bearings. Fewer actual parts are used — power flow is free and direct.

HOW BUCYRUS-ERIE INDIVIDUAL DESIGN HELPS

put more of your excavator power to work

When the maximum of your excavator's rated engine horsepower goes to work you get many advantages — most effective digging, fast work cycles, real fuel economy, and high overall output.

With Bucyrus-Erie's Individual Design of each model in the line you are sure that for every machine: (1) the power plant is carefully selected to handle the rated capacity; (2) power flows freely through efficient machinery designed for that model alone; (3) the machine is engineered with plenty of strength but without deadweight that accompanies under-powering one machine to make a "new" model.

Individual Design does more than get the most from power — it saves maintenance, lengthens excavator life, gives you more excavator for your money. Your Bucyrus-Erie distributor will give you the complete story on this outstanding line of ⅜- to 4-cu. yd. gasoline, diesel, and single motor electric excavators.

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BUCYRUS-ERIE COMPANY

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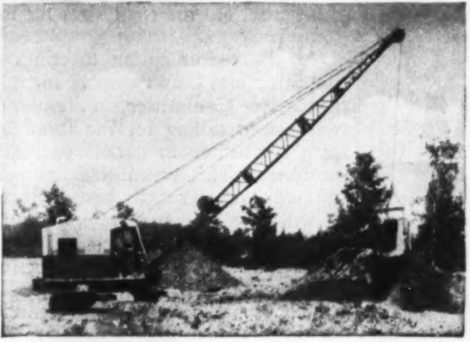

No Power Is Wasted Swinging Deadweight because Individual Design tailors each part for its job on a particular model without adding useless weight. Strength is added and weight further reduced on main and truck frames with box-section design and internal reinforcing ribs. Dragline booms are of all-welded, lattice-type construction with no excess weight but strong enough to take compression and swing stresses. Shovel front ends combine light weight for faster swing with plenty of strength for tough digging.

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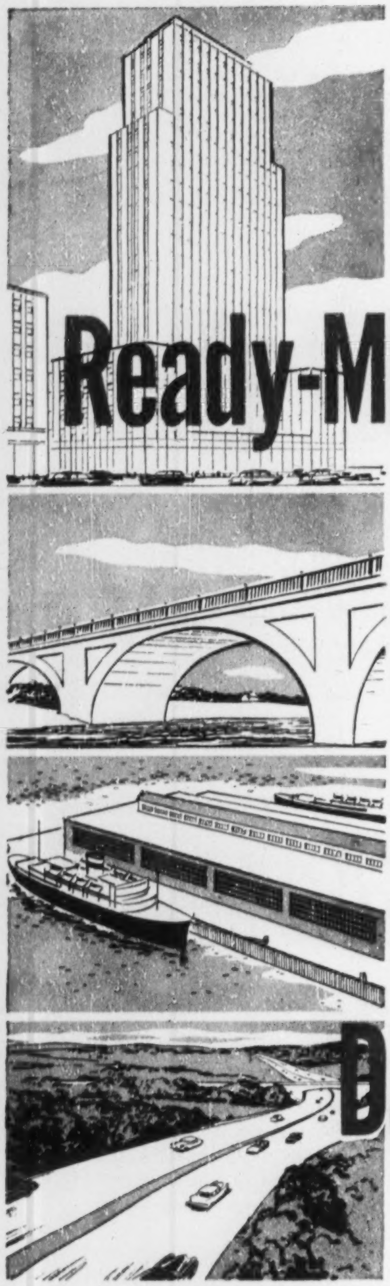

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READER COMMENT

Development, not force

SIR: My attention has been called to the July 22nd issue of ENGINEERING NEWS-RECORD, which contains on page 17 several paragraphs headed "Packaged Brick". This item gives the impression that the Mason Contractors Association is trying to get manufacturers of clay products—among others—to adopt a standard 24" x 32" package as a basic specification.

Actually, the MCAA convention action directed the Association's Committee on Technical Research and Development to investigate all feasible sizes of masonry packages, using the 24" x 32" package as a basic specifica-

After it was pointed out by both manufacturers and dealers that this one particular size was not necessarily the answer to all masonry packaging problems, the committee very wisely proceeded on the basis of negotiations with manufacturers and others in determining what specification, or specifications, might be arrived at mutually.

At the present time, representatives of the brick and tile industry, including staff members of the Structural Clay Products Research Foundation, have held several meetings with this committee and everyone seems to be in accord on the approach to determine what are the right sizes for masonry packages.

At the recent spring meetings of the Structural Clay Products Institute Executive Committee, a resolution was passed calling for the formation of a committee to handle packaging problems. This committee has been formed and will shortly be announced. It will work with the MCAA and any and all other groups interested in the packaging field toward solving the problems of job site efficiency, in which proper packaging and handling of material play such a major role.

JOHN J. HASSETT
Director of Public Relations
Structural Clay Products Institute
Washington, D. C.

Long three-hinged arches

SIR: We have noted with interest the editorial (ENR June 24, 1954) concerning the information on long three-hinged arches that has been uncovered since the story about the 278 ft span Ideco hangar at the Greater Pittsburgh Airport appeared in the April 8 issue.

Like you, we doff our hats to the engineers of 1893 who built a roof

(*Continued on page 14*)

how CLINTON WELDED WIRE FABRIC builds long-lasting culverts...

High strength to resist heavy loads and smooth walls that assure no loss of velocity mean low maintenance costs and the use of minimum size pipe. From any viewpoint—for new construction or repair—the wise choice is concrete pipe reinforced with Clinton Welded Wire Fabric.

Clinton Welded Wire Fabric meets all A.S.T.M. specifications and is available in a wide variety of gauges and spacings for every requirement. Write to our nearest District Sales Office for further information.

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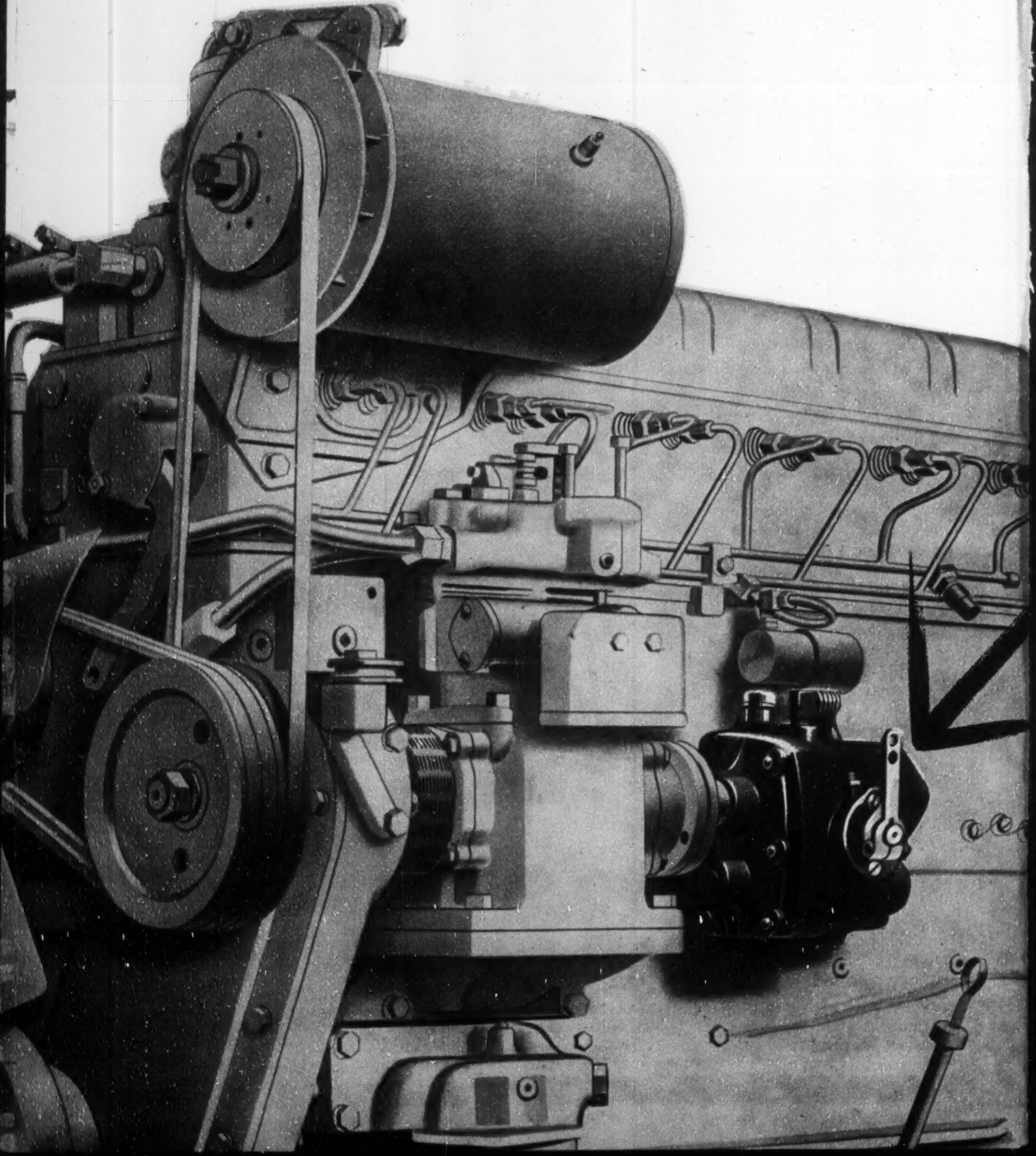
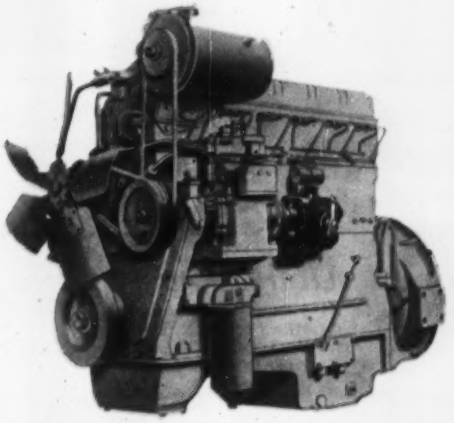
Cummins new, exclusive diesel



fuel system needs no specialists!



PT Fuel System standard on all models...simpler to work with than gasoline carburetion and ignition

- Fuel system servicing costs become negligible.
- Compact pump weighs only 13 pounds—system has no fuel racks to adjust . . . no check valves, metering plungers, discs or floats—pump not timed to engine.
- Fewer parts than any fuel system on any heavy-duty engine.
- Adaptable to all Cummins Diesels built since 1932.

Write for your copy of descriptive folder "Cummins PT Fuel System."

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Engine Company, Inc., Columbus, Indiana

Leader in rugged, lightweight, high-speed diesels (60-600 h.p.)

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USE GRIPPER GROUSER SHOES

ELIMINATE SLIDING AND SLIPPING

Especially effective in IN SIDE-HILL WORK
IN HEAVY ROCK WORK
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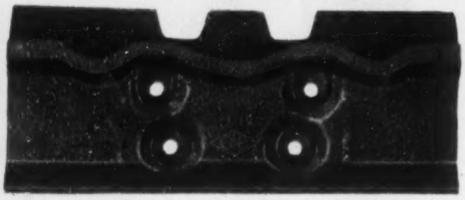

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CALENDAR

American Society of Civil Engineers, hydraulics division, annual convention, Austin, Texas, Driskill Hotel, Sept. 8-10.

National Highway Conference of County Engineers and Officials, ARBA, Deshler-Hilton Hotel, Columbus, Ohio, Sept. 13-15.

Society of American Military Engineers and American Society of Civil Engineers, District 7, joint meeting, Hotel St. Paul, St. Paul, Minn., Sept. 13-14.

Illuminating Engineering Society, national technical conference, Chalfonte-Haddon Hall Hotel, Atlantic City, Sept. 13-17.

Western Association of State Highway Officials, Challenger Inn, Sun Valley, Idaho, Sept. 16-18.

Public Works Congress of the American Public Works Association, Claridge Hotel, Atlantic City, Sept. 19-22.

Society for Experimental Stress Analysis and International Congress and Exposition: Bellevue-Stratford Hotel, Philadelphia, Sept. 21-23.

Southeastern Association of State Highway Officials, annual meeting, Andrew Jackson Hotel, Nashville, Tenn., Sept. 28-30.

New England Water Works Assn., Poland Springs, Me., Oct. 4-6.

Federation of Sewage and Industrial Wastes Associations, Cincinnati, Netherland Plaza Hotel, Oct. 11-14.

National Conference on Industrial Hydraulics, annual meeting, Sheraton Hotel, Chicago, Oct. 14-15.

Structural Engineers Association of California, Hotel del Coronado, Coronado, Calif., Oct. 14-16.

American Society of Civil Engineers, annual convention, Hotel Statler, New York City, Oct. 18-22.

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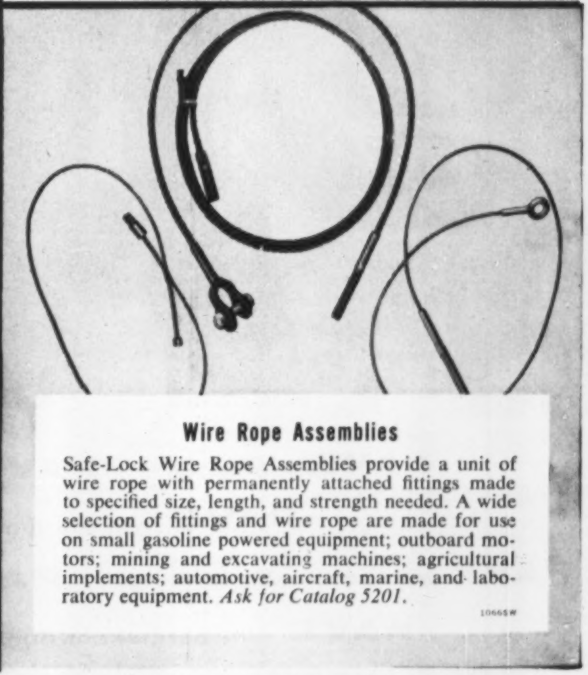

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THE CONSTRUCTION WEEK

TOUGH JOB—It will be interesting to watch the bidding Sept. 24 for purchase and removal of 18 buildings (called Lamokin Village) owned by the HHFA at Chester, Pa.

The buildings are one-story, cinder block structures, with pitched roofs, 6-in. concrete slab floors.

FISH STORY—Recognizing that one of the biggest obstacles to power production in the Northwest is fish, the state governors decided to take some positive action.

They invited fishing interests in the Columbia Basin to sit in on studies the governors' engineering committee is making in an effort to resolve problems that stand in the way of some 36 hydro projects (11,600,000 kw) planned over the next 15 years.

BLOW IT DOWN—Not to be discouraged by such an elemental thing as fog—a serious hazard to safety on its right of way—New Jersey's Turnpike Authority is going to try blowing the fog away.

Four installations of a new device (a big propeller driven by a powerful motor, high on a shaft) will be put up along the pike, to see if heavy ground fogs can be materially dispelled.

STRONGER THAN YOU THINK—The highway contracting segment of construction doesn't know its own strength or its potential—but ARBA is going to do something to fill this gap in knowledge.

Meeting at Mackinac Island, ARBA directors ordered formation of a fact-finding committee, under chairmanship of Burton Miller, managing director of the highway contracting division.

HELP FOR LUMBER—That settlement of at least a part of the lumber strike in central California will be a boon to contractors.

Strikers were located in 11 mills that specialized in pine and fir products. The strike isn't completely over—4,000 returned to work, on an agreement that gained them only one additional paid holiday (after a two-month strike) but 2,000 members of the group still are out.

BUSINESS DUE—There's a lot of construction business upcoming—if everybody agrees on what should be done to develop additional power from California's Trinity River.

Potential is estimated at 70,000 kw, irrigation for 205,000 acres, construction cost about $270 million (including power). Bureau of Reclamation is making a new study—to see if private and public development can be combined.

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WASHINGTON OBSERVER

The Air Force has won a small victory in its long campaign to get its own construction under its Air Engineers. Certainly, a new directive just put out by the Secretary of Defense is a nose under the tent.

Air Force may now supervise buildings of its own research facilities if they are peculiar to aircraft development, and may control design of other technical facilities. This is interpreted to mean that another Tullahoma, Tenn., testing station, or further building of the chain of guided missile bases off the Florida coast, or rebuilding of such bases as Edwards in California will go over to Air Engineers.

Army Engineers and Navy's Bureau of Yards & Docks have held out for doing Air Force construction. They still have control over general construction, except that even here there is some "foot in the door" language: Air Force will have jurisdiction over "other projects" that the Air Secretary asks the Defense Secretary for—unless Charles Wilson overrules. (The other services get a chance to put in their oars before the decision is made.)

Air Force argues for its own corps on ground that it must train its men, must control the special techniques peculiar to its service. To date, Air Engineers have been confined to elementary construction training. However, in the last year the AF has got 47,000 engineers from the other services into its own blue uniform. It now has Maj. Gen. Lee B. Washbourne sitting as Assistant Chief of Staff for Installations, certainly an embryonic full chief of engineers.

•

Eisenhower's $50-billion highway program is getting under way fast. Gov. Walter Kohler and the Governor's Highway Committee will meet again at mid-month in Chicago. Main object: to nail down general ideas on financing of the program without direct increases in taxes.

Gen. Lucius D. Clay's appointment as head of a Presidential advisory committee on roads this week will help get things moving quickly. The Clay group will have broad public representation.

Some kind of long-term borrowing or some kind of corporation along the lines of FHA or the St. Lawrence Seaway is about the best guess as to a new approach to financing roads that you get so far. Certainly, every effort will be made to get the increase in federal grants without increasing the federal gasoline tax.

•

Expenditures by home owners on housing repairs and improvements will be gathered into a Commerce Department report due out soon. It's based on Census Bureau survey made in June covering over 15,000 families in 230 communities. It's the first survey of its kind.

There'll be a breakdown on house repair expenses since Jan. 1. Materials purchases, kinds of repair and improvement done, and work done by do-it-yourself home owners are included.

•

Fast tax writeoffs for defense plant expansion will be limited to new plant. The Administration has finally turned down the idea of letting repairs of old buildings and facilities get the break, too. Some government officials thought this would help maintain the defense mobilization base.

But the desire for dispersal prompted the inter-agency Defense Mobilization Board to rule out repairs. Incentives should be withheld when plants are in critical target areas, it ruled.

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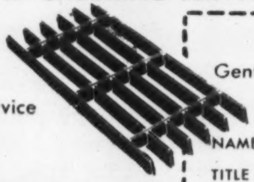

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Big market for builders in Post Office plans

Department surveys sites in 50 cities for the construction of special-purpose buildings to modernize mail handling

There is a live and growing multimillion-dollar market for private construction of special-purpose buildings to serve the Post Office Department, Opportunities for the kind of construction are even bigger under improved straight leasing arrangements than under the new lease-purchase contracts recently authorized.

According to the department's Bureau of Facilities, headed by Assistant Postmaster General Ormonde A. Kieb, straight-leasing contracts are likely to be used much more widely than lease-purchase to meet the department's constantly growing and changing needs for new buildings. They will be employed to obtain space in specially designed buildings for the handling of bulk mail.

• **Needs being surveyed**—Studies are now under way in more than 50 cities to determine the space requirements and desired locations for such buildings. In only four cities does the department have mail handling buildings—in use or under construction—that meet today's requirements for efficient and economical operation. Depending on the size of the city, those four privately owned buildings cost $1.25 million to nearly $9 million without mail handling equipment installed by the Post Office Department.

But the high-priority need for bulk mail facilities indicates only a fraction of the department's growing space requirements. Including post offices, branches, stations and other structures, the department has under lease more than 7,000 facilities, with an estimated total floor area of up to 75,000,000 sq ft.

Leases on these facilities come up for termination or renewal at the rate of 1,200 to 1,500 a year. At least half of the cases require expansion of space. Need for either more space or better location may compel a move to a new building. Since Jan. 1, the department has awarded straight-leasing contracts for $20 million of new buildings under the terms of the old law.

• **New law more flexible**—Moves of that kind are made easier by amendments enacted in the new law. The 1954 act greatly increases the authority of the Post Office Department to obtain new building space by straight leasing from private owners—as well as by lease-purchase agreements. Real estate people in the department expect to fill most of their needs by straight lease methods.

Most important, the new law permits the Post Office Department to option, lease or buy the sites selected for its new buildings. That change eliminates the old handicap under which the department had to depend on site owners—such as railroads—to grant it a cost-free option or otherwise run the very real risk of exorbitant land costs skyrocketed by speculators. Now the department controls the land and transfers it to the successful bidder on the lease contract.

Also, the new law allows a 30-year lease instead of the 20 years formerly permitted, thus making a lease contract more attractive to long-term investors like life insurance companies. As before, the department can—and does—include in the contract optional extensions of the lease. These options, commonly for several five-year terms, are binding on the government.

Further, lease contracts can be written with an escalator clause to take care of future changes in local property taxes. This clause relieves bidders of having to make allowance in their rental bid prices for future tax increases. The escalator works two ways: if taxes go up, the government pays the increase, if they go down, the government recovers the difference. Post Office officials say the tax escalator will save about $16,000 a year on the $4.5-million terminal annex for mail handling in Seattle, where construction has begun.

• **Bulk handling top problem** — Top men in the Facilities Bureau—such as Irving Thomas, who is Kieb's administrative aide, and Rollin D. Barnard, director of real estate — are reluctant to name cities where the most urgent needs exist. To mention specific cities, they explain, could cause some wild land optioning by people looking for a quick profit. But

(*Continued on page* 22)

Building trades unions gird for drive to make Taft-Hartley campaign issue

Candidates for Congress in the fall political campaign now getting under way are certain to get an earful of criticism of Taft-Hartley as being a law ill-suited to the realities of the construction industry.

There are many signs already that the building trades unions are girding themselves for a renewed drive for T-H revision. And, there's little doubt that many government officials charged with enforcement of the law will be backing moves for revision.

You can add up the moves signalling such a drive very quickly:

- After the dismal failure of attempts to revise the act several months ago (ENR May 13, p. 28), Richard Gray, president of the AFL's Building Trades Department called for an all-out attack on the law through the device of "reading the book"—creating a nuisance by making all manner of demands allowed by the statute.
- Continuing efforts of contractor groups to bring needed changes to the attention of Congress.
- The obvious confusion of the National Labor Relations Board itself in handling construction disputes, and its deliberate attempts to pull back from heavy participation in the industry's internal troubles.
- And, if you want to go back a bit further, there was Senator Taft's own statements that he—as author of the law—did not contemplate that construction should be covered, and would sponsor changes to aid the industry (ENR Nov. 27, 1952, p. 27).

• **Key points**—Conscious of the fact that—more than most industries—construction costs are largely a reflection of labor costs—construction men of both sides of the labor-management fence were pleased when President Eisenhower hit on three of the more

(*Continued on page* 28)

. . . Post Office

(*Continued from page 21*)

it is obvious that every good-sized city needs mail handling facilities except the four already taken care of—Miami, New Haven, Cleveland and Seattle.

Chicago, for example, is dumping mail in eight places. Operations could better be concentrated in a single industrial-type building designed for mechanized mail bundling. And the preferred location would be in the city's fringe area where light industry, warehouses, and freighting companies are locating. Post Office people want to get away from outmoded mail handling buildings in congested downtown areas where they cannot use big semi-trailers and other money-saving mechanical equipment.

• **Where to get information**—Officials don't want queries on prospective new buildings to come to Washington. They couldn't answer the questions there. The Post Office Department has 15 regional realty officers to handle matters of that kind. But people who want information on projects as they develop can get on the department mailing list by addressing the Assistant Postmaster General, Bureau of Facilities, Division of Real Estate, Washington 25, D. C.

Regional realty officers are located in New York, Denver, Chicago, Seattle, St. Louis, Kansas City, Boston, Cincinnati, Philadelphia, Atlanta, Chattanooga, San Francisco, Fort Worth, St. Paul, and Washington, D. C.

• **How projects are developed** — Mail handling facilities are first on the priority list. Here is the typical operation for developing a project—say for a large city that needs 700,000 to 800,000 sq. ft. of space in a new building:

Two bureaus of the department—Operations and Transportation—make a detailed study to determine space requirements and desired location. Field men and headquarters staff work together on this survey. Then the findings are turned over to the Real Estate Division, whose engineers make a layout for the best use of space and work out a formula for land needed. The division then goes out to nail down the site by option, lease or purchase.

These steps take time—much more time than is required ordinarily for other Post Office facilities where field investigations are started a year before the expiration date of a lease.

Department policy on the best way to make up proposals for bids on straight lease building projects has not been settled. Right now, the department prepares the preliminary schematic design and basic specifications. These go out to the regional realty officer to advertise for bids.

Under this procedure, architect-engineers for each bidder work up preliminary drawings and specifications to be submitted with the bid. They also settle any questions about changes in basics that they think would improve the value of the building for the bidder. After award of the contract, the successful bidder's professional people produce the final, working drawings in consultation with the department staff.

• **Procedure stirs controversy** — This method has been criticized severely by architects, engineers and contractors, because it involves competition on design as well as construction and imposes the cost of preliminary design work on every bidder. But some bidders like it, say it gives them an added competitive chance and enables the potential owner to design the building for greatest long-term value.

Critics contend that the government will get a lower price if it calls for bids on a completely designed building. That is the position of many contractors and professional people. They advocate that the Post Office Department engage a private firm to do a complete design job and offer it for competitive bids, putting all bidders on equal footing.

That is what the department intends to do on lease-purchase buildings that eventually become government-owned. And it will do the same for straight lease projects if convinced that a saving to the government will result. As of now, however, competitive bidding on the basic package of schematic drawings and outline specifications has the edge.

• **Where lease-purchase comes in** — Lease-purchase projects will be favored by the Post Office Department where the future use of a facility—and the demands upon it—can be pretty definitely foreseen for scores of years ahead. This might be the case for a post office or station in a locality where the population and postal load have become firmly stabilized over a long period—with no prospects of change.

But rapidly changing requirements for other facilities—such as mechanized postal plants for handling bulk mail—cause the department to put a high premium on flexibility. It wants to keep clear of acquiring ownership of buildings, or even leasing them for too many years, where population growth and other factors indicate that future changes will be needed.

Social Security

NSPE criticizes new law for including engineers but not doctors, lawyers

Last minute congressional action in placing self-employed engineers and architects under the Social Security system has drawn sharp criticism from the National Society of Professional Engineers.

Clarence T. Shoch, NSPE president, in a statement last week, charged Senate-House conferees with having been "arbitrary and discriminatory" in adopting mandatory social security coverage for self-employed professional engineers, while allowing lawyers, doctors, and dentists to remain outside the act.

Opposition of NSPE and other engineer groups to Social Security coverage was based primarily on the act's retirement provisions. The engineer groups contended that the self-employed professional generally doesn't retire at 65 and that he stands to lose at least part of the normal retirement benefits between the age of 65 and 72, which under the law are cut according to a sliding scale if he earns more than $1,200 annually.

The new law subjects the first $4,200 of annual earnings of a self-employed engineer or architect to a 3% Social Security Tax, beginning Jan. 1, 1955.

Architects and engineers not previously holders of Social Security cards can obtain them from the nearest Social Security office in person or by applying on Form SS-5 obtainable from any post office.

Blasting on N. Y. Thruway halted by damage reports

Home-stretch construction on the New York Thruway near New York City last week hit a temporary snag as a result of a flurry of blast-damage incidents. Fly-rock damage to homes, autos and utilities in three communities—Yonkers, Tarrytown and Hillburn—caused suspension of three contractors' blasting permits.

Local newspapers attributed the sudden plague to contractors' efforts to speed up rock-excavation schedules in order to meet contract schedules.

Hoping to get their permit reinstated quickly, the contractors sent out distress calls to the dynamite manufacturers; at least two companies were known to have sent their top blasting experts to advise the contractors and assure the municipalities that improved practices would forestall further damage.

Defense Department plans fast start on housing for military installations

The Defense Department is planning to engage 25 to 30 separate architect-engineer firms for design work under the $75-million military housing program approved by Congress.

Assistant Defense Secretary Franklin G. Floete is moving fast to get the program underway. He aims at getting construction started on the first projects early in 1955 and completing the award of contracts before June 30.

But his first objective is the drafting of basic standards for the construction. For this assignment, the military will call on private architect-engineer firms to contribute to the development of housing criteria.

At the top level, the Washington firm of Keyes, Smith, Satterlee and Lethbridge Associates already has been engaged to work on the housing standards with Floete's office. Collaborating with the top unit will be some 25 to 30 separate architect-engineer firms that will be engaged to design the first high-priority pilot projects.

• **Districts to make awards**—On these projects—as well as on all others in the program—contracts both for architect-engineer services and for construction will be awarded by contracting officers responsible for the areas in which projects are to be built.

For Air Force and Army projects, the contracting officer will be the District Engineer, Corps of Engineers; for Navy housing, contracts will be handled by the district public works officer in the Naval district having jurisdiction.

Drafting of housing criteria, including standards for site use, will be pushed rapidly. Floete's technical and housing assistants, with the Construction Division in the Assistant Secretary's office, will have the main responsibility for developing the basic standards.

Findings and recommendations of the architect-engineers will largely determine the results. The end product sought is a set of realistic and workable basic rules that will yield the greatest value per dollar expended.

As these firms move into their preliminary planning, they will be called upon to participate in joint development of criteria. Through a melding of architect-engineer thinking, the construction officials in the Defense Department hope to produce a set of criteria that will stand the test of time.

• **Await project clearance**—Allotment of funds to the three services under the $75-million appropriation had to await signing of the bill by the President. In turn, the services had to delay submitting their top-priority projects until they had received their money allocations.

These pilot projects now seem sure to get quick approval of the Secretary of Defense. Under the law, the Defense Secretary has to certify for each military project that it will not adversely affect private rental housing in the vicinity, including privately built Wherry Act housing for military families.

Once the pilot projects are cleared by the Defense Secretary, the district offices can go ahead with steps leading to the award of architect-engineer contracts. Standard procedure—soliciting separate proposals from several firms—will be generally followed in determining the design firm to be engaged for each project.

Projects must be selected from a list that Congress approved when it passed a separate bill authorizing 12,000 family units for the military. This bill set a $175-million limit on cost of the authorized housing. But Congress appropriated only $75 million for construction in this fiscal year.

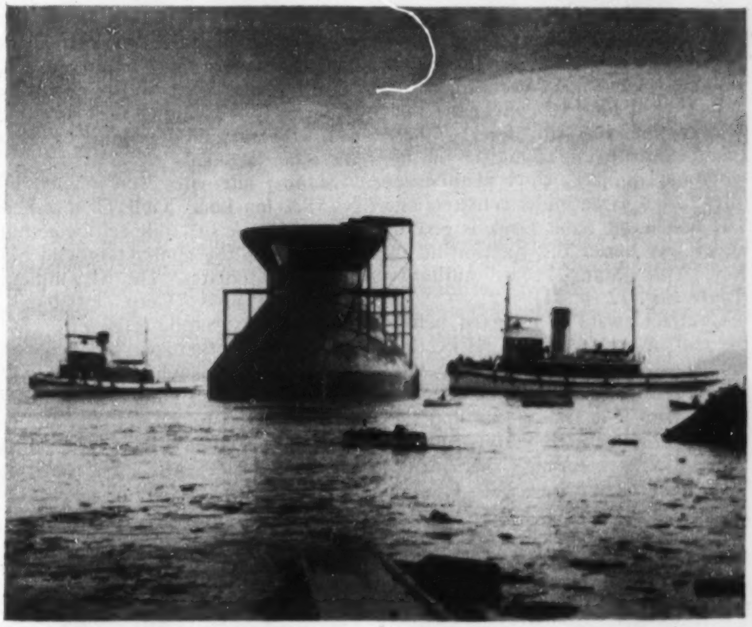
For various military and naval installations in the United States, the authorization bill listed housing projects that range from more than a thousand units to less than ten. Many of them are in the range of 50 to 200 units. Costs are limited to $10,040 per unit for enlisted men, $11,040 for company grade officers and $12,040 for field grade officers.

Some 60% of the authorized housing is for enlisted men's families.

• **New criteria to be followed**—Housing standards will be developed along the lines of those recently issued or under study for other types of military construction. The standards become mandatory upon the military services when issued.

An example is the standards of construction lately put in effect for permanent barracks. These standards lay down basic guide lines for arrangement and use of allowed space, for number of plumbing fixtures and for quality of construction in buildings of one, two and three stories. The standards apply only to fundamentals that are uniformly adaptable to varied sites and projects.

Floete also has issued a basic directive on air conditioning for hospitals and medical facilities.



Lighthouse launched like a ship

Tugs maneuver the steel shell for a new Canadian lighthouse after it was launched from ordinary ship slipways near Quebec City. The shell was built by Davie Shipbuilding, Ltd. It will replace a lightship at White Island in the St. Lawrence River opposite the mouth of the Saguenay River. After the launching, concrete to a depth of 9 ft 6 in. was placed in the shell to give it a draft of 25 ft. Then it was towed 120 mi downstream and sunk on a specially prepared crushed rock mattress.

BOTH U. S. AND CANADA will base design of St. Lawrence Power construction partly on scale models like this one which duplicate conditions over a 35-mi stretch of the river.

Canada launches power job

Ontario Hydro opens bids for two St. Lawrence cofferdams; selects team to direct construction and resettlement jobs

The Hydro-Electric Power Commission of Ontario (HEPC) opened bids in private last week for the first Canadian construction on the $600-million St. Lawrence Power project.

Bids were for two cofferdams that will enclose the site for Barnhart Island power plant, second of the international project's three main structures to be placed under construction. The first, Long Sault Dam, is getting under way under the sponsorship of New York State Power Authority (ENR Aug. 12, p. 21).

Contract award is expected before the end of next week. If HEPC follows its usual practice, the names of unsuccessful bidders will not be made public. But it is known that approximately 40 construction firms, including syndicates of leading Canadian and British contractors, have been figuring the job.

The two cofferdams will straddle the international boundary between Canada and the United States. The first will be approximately 500 ft long, stretching across the north channel of the St. Lawrence River from Sheek Island on the Canadian side to Barnhart Island on the U. S. side. This rock-and-earth-fill dam will stop the flow in the north channel to facilitate work on the second and larger cofferdam.

The second cofferdam will be about 4,500 ft long, extending across the north channel from the Canadian mainland to Barnhart Island. It will be either rock-filled timber crib with steel sheetpile facing or steel sheetpile cells with earth fill depending on costs and other factors.

Similiar alternates were offered by NYSPA for Long Sault Dam cofferdams, and the sheetpile cells were bid lower by all the contractors who bid on both alternates. The $1.9-million low bid by Dravo Corp., Pittsburgh, Pa., was for sheetpile cells.

Dewatering the area between the two Barnhart Island cofferdams will accomplished by pumps with sufficient capacity to do the job in 30 days and maintain the working areas free from water until about April 1, 1955, when the job will be taken over by the powerhouse contractors.

Bidders on the two cofferdams and the dewatering job had three choices:

- They could bid on the entire job.
- They could bid on the smaller cofferdam and the part of the larger cofferdam on the Canadian side of the boundary.
- They could bid on the section of the larger cofferdam on the U. S. side and the dewatering job.

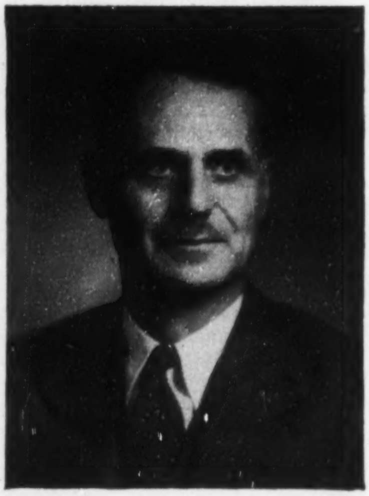
The successful bidder is expected to start work within 10 days after he receives notice of the award of contract. That means that contractors will be on the job no later than mid-September.

The first international firm to obtain a contract on the Canadian side is Cementation Co., Ltd., Toronto. Contract was for a $33,000 project office building. The contract was let on Aug. 16, and the building is expected to be completed by the end of September. Cementation Co., Ltd. is a subsidiary of the British concern of the same name. The company specializes in rock foundation work and is expected to bid on other St. Lawrence power jobs.

• Scale models will cut costs–Since 1913, HEPC has spent $2.7 million on exhaustive studies of the St. Lawrence River and surrounding terrain. With the data assembled, HEPC engineers have constructed three hydraulic scale models of the river at the HEPC service center in Islington, outside Toronto. Designs for both the Canadian and U. S. construction are being based in part on data obtained from model studies.

These models duplicate river conditions on both the U. S. and Canadian sides, including shore line, river bottom contours, and turbulence and flow. They cover 9,930 sq ft of floor space and reproduce a 35-mi stretch of the river. The models cost $164,400 but are expected to save HEPC and NYSPA millions of dollars on construction costs.

A major problem of the Canadian side of the power project is the flooding of large areas of farm land and small communities to create the head pond above the powerhouse. About 16¼ sq mi will be inundated, including the villages of Iroquois, Aultsville, Farran Point, Dickinson Landing, Wales,



GORDON MITCHELL was appointed director of the St. Lawrence Power project.

Moulinette, Mille Roches, and about one-third of Morrisburg.

Altogether some 5,000 people will be affected. This relocation will raise Canada's costs for land and land rights to more than four times that of the U. S.

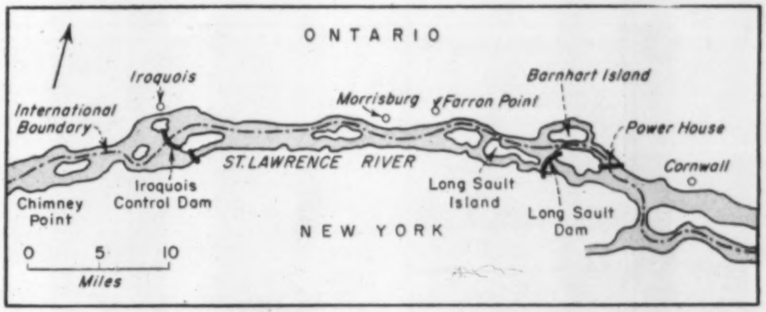
Ontario's Department of Planning and Development and HEPC have worked out a plan for relocation, rehabilitation, and community planning of the area. This plan is subject to modification after consideration by all the communities involved. No official cost estimates have been made, but experts have estimated that the relocation job will cost anywhere between $65 million and $100 million.

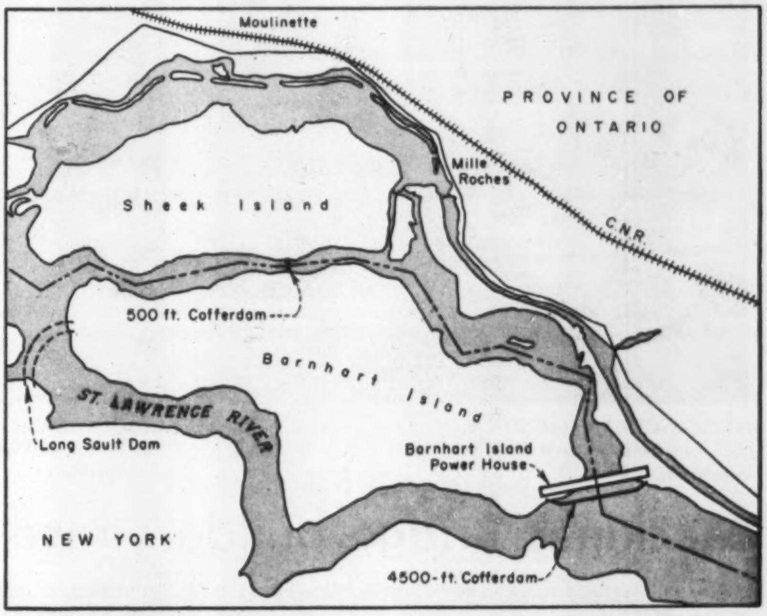
The proposals call for three separate new communities to replace those in the area to be flooded. The built-up section of Iroquois will be entirely flooded. Plans have been developed for a new Iroquois to be located in an area still within the present corporate limits of the village.

A new town will replace Aultsville, Farrans Point, Dickinson Landing and Wales. Another new town will replace Moulinette and Mille Roches.

The village of Morrisburg will be partially flooded, but the flooded area will include the entire business district and some residential property. It is proposed that this section be relocated within the corporate limits.

The plan is a long-term scheme, that takes into account the need for future expansion of the new communities from about 5,000 population to 30,000 or more.





• **Top officials named**—HEPC has appointed two key officials for the project. Gordon Mitchell, formerly project manager at Sir Adam Beck Niagara generating station 2, has been appointed director of the St. Lawrence Power project. He is a graduate in civil engineering of the University of Toronto and has been HEPC's construction engineer on power projects since 1937.

WILLIAM HOGG has been named field engineer of the St. Lawrence Power project.

William M. Hogg, formerly assistant field project engineer of the Niagara development, has been named field project engineer on the St. Lawrence job. Also a graduate civil engineer, University of Toronto, he has held many posts with HEPC, including design engineer and senior resident engineer at the Des Joachims development on the Ottawa River.

Organization for the St. Lawrence Power project has been detailed and thorough. HEPC has lined up sources of supply of raw materials needed in the gigantic project so that there will be no holdup on materials and prices. HEPC's equipment used on the Niagara job and other major postwar jobs will be utilized as much as possible on the new project. Labor sources have been studied, and arrangements made with the United States and Canadian governments for waiving customs duties and immigration formalities for firms of either country working on the project.

HEPC, which customarily does its work by force account, will let most of the jobs on its side of the river to contractors. No estimate of the percentage of the job to be contracted out is as yet available, but HEPC officials say by far the largest part of the work will be done by contractors.

The sale of bonds and debentures guaranteed by the Ontario government will finance HEPC's share of the $600,000,000 project.

Data shows that the average flow of the St. Lawrence River is 237,000 cfs. This compares with 200,000 cfs on the Niagara River. HEPC engineers say a generating station on the St. Lawrence will be capable of turning out more energy in relation to its installed capacity than any other power development in North America because of the dependability of flow in the river.

Maximum flow is less than twice the minimum in the St. Lawrence. At Grand Coulee Dam on the Columbia River maximum flow is up to 28 times the minimum. Power generated from the St. Lawrence River will flow into a grid covering about 325,000 sq mi of Ontario—as far west as Sault Ste. Marie and north to within 120 mi of James Bay.

RECTANGULAR CAISSON in place for south cable support-pier construction is seen from bracing for the south anchor pier cofferdam.

CIRCULAR CAISSONS for the two suspension-tower piers that will be founded on rock 200 ft below the surface are seen at construction site.

Mackinac Bridge builders race against time

The contractor for the substructure of the $80-million, 5-mi-long bridge across Mackinac Straits in Michigan is in a race against time to complete underwater construction on six suspension bridge piers before the winter freeze.

At stake is completion of the project by the scheduled date–Nov. 1, 1957. Engineers on the job agree that hitting this target date depends largely on how much underwater construction can be done this season.

If the six piers can be built up to approximately water level this year, they can be topped out quickly early next spring. That would leave three full construction seasons during which completion of work on the superstructure could be accomplished.

But if substructure work drags on into next year, planners of the bridge say it will be virtually impossible to complete the huge structure by the scheduled date.

Merritt-Chapman & Scott Corp., New York, contractor for the substructure, is running hard to win this race. Grover Denny, project manager for the $26-million job, admits his construction schedule is about as tight as it could be. But he says this job will be done by Dec. 15 when the freeze-up is expected.

The piers under construction are the two tower piers to be sunk by caisson nearly 200 ft below the surface of the water; the two anchor piers, each of which will contain 85,000 cu yd of concrete and will be built by cofferdam methods; and the two so-called "cable support" piers located between the anchorages and the tower piers. One of these will be sunk by caisson (photo left), and the other will be built in a cofferdam which now is under construction.

The south anchor pier cofferdam has been completed and is being built up underwater with grout-intruded concrete–the method which also will be used on other substructure concrete work. Bracing is being set and sheet-piling driven for the north anchor pier.

Caissons for the two tower piers are being built in Alpena, Mich., on Lake Huron about 75 mi from the bridge site, by Wiltse Bros. Corp. (photo right). One of these caissons is now complete and will be towed soon to the bridge site and sunk. The other is more than half completed.

These caissons, built on land, are moved 500 ft overland into the lake. To accomplish this, the builder first excavates around and beneath the caisson to be moved. Then, with bulldozers and power shovels he digs a canal 15 ft deep between the caisson and the lake.

When the canal is completed and the caisson is ready to move to the bridge site, a temporary dam is blasted out to let in lake water which floats the caisson into the lake.

Another problem in connection with this bridge is what should it be named. Generally it is called the "Mackinac Straits Bridge." But at last week's meeting of the authority charged with direction of its construction, Authority Chairman Prentiss M. Brown offered the suggestion that the word "straits" be dropped from its title.

Brown also advised that the word "Mackinac" might be changed to "Mackinaw" as in Mackinaw City, the southern portal of the bridge.

Attending the meeting last week D. B. Steinman, designer of the bridge; his project manager, Herbert Goodkind; his special consultant, Glenn B. Woodruff; William Denny, vice president and general manager of M-C&S; his brother, Grover Denny; and John Zorn, special assistant to the president of U. S. Steel's American Bridge Division, holder of the $46-million contract for the superstructure of the bridge.

Jobs in the news

AIRPORT—Corps of Engineers has awarded an $18.6-million fixed-fee contract for construction of airport facilities in the Azores to Oman Construction Co., R. F. Farnsworth and Wright Construction Co., Nashville, Tenn.

DAM—Seattle, Wash., Board of Public Works has called bids for opening Oct. 6 for construction of the $17-million Gorge High Dam. The structure will be a combination arch and gravity-type dam, rising 150 ft above the river bed. The project will include about $2 million of highways and bridges providing access to the site.

OFFICE BUILDING—Shelby Construction Co., Inc., New Orleans, will build a $5-million, 19-story office building in Columbus, Ohio, for Chipley Realty Co. The building, first major office building erected in Columbus in 25 years, will have an aluminum and glass exterior. Richard Roth, New York, is the architect.

FREEWAY—Washington State Toll Bridge Authority has selected Tudor Engineering Co., San Francisco, and J. E. Greiner & Co., Baltimore, to make engineering studies for a proposed freeway through Seattle, from Tacoma to Everett. Estimated cost is $175 million.

HOUSING—Eichler Homes Construction Co., Inc., of Palo Alto, Calif., is planning a $9-million, 170-acre residential development in Walnut Creek, Calif., to contain 560 homes.

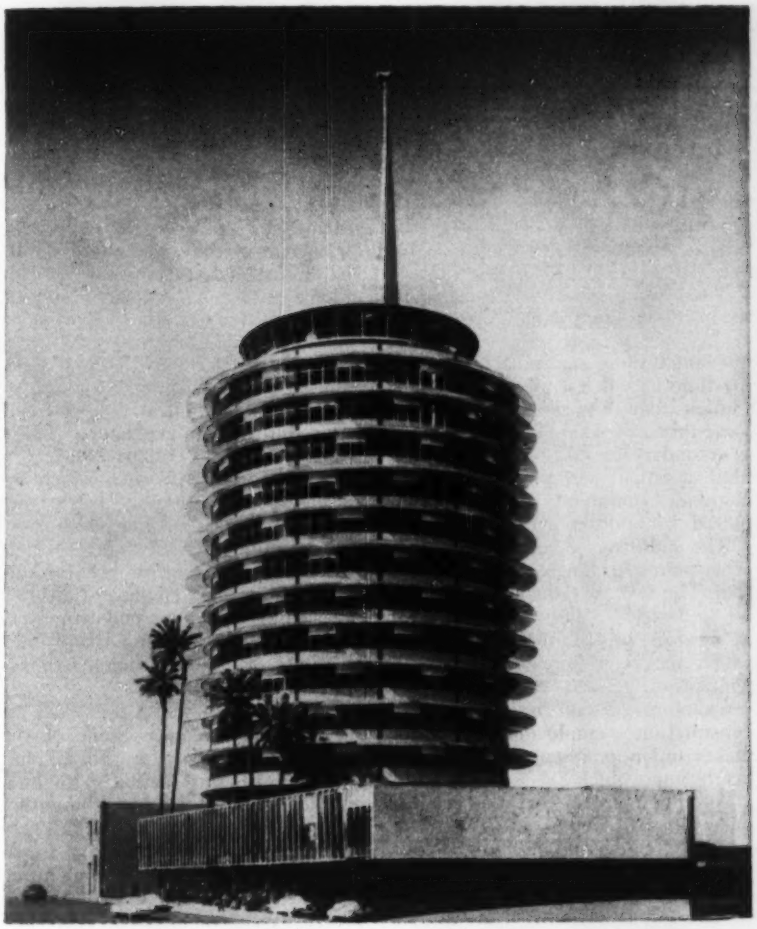
CATHEDRAL—Turner Construction Co., New York, has been awarded the contract for construction of the $8.5-million Cathedral of the Assumption of the Blessed Virgin Mary in Baltimore. Exterior to be of limestone trim and ashlar limestone with limestone arches supporting the main roof. Floors will be of marble and terrazzo.

U. S. Chamber of Commerce sponsors highway conference

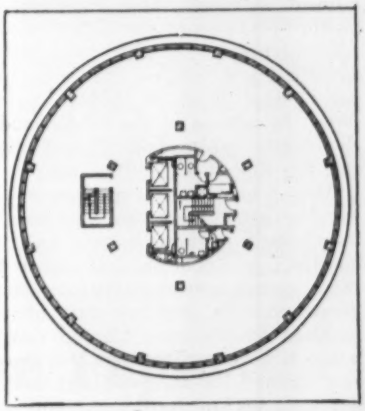
The first in a series of state highway conferences sponsored by the U. S. Chamber of Commerce to promote rapid improvement of the nation's highways will be held in Topeka, Kan., Sept. 30.

Speakers at the conference will analyze highway needs in line with President Eisenhower's suggestion that an additional $50 billion be spent over the next 10 years to modernize roads.

Information developed in the series of state conferences will be used in preparation of the chamber's highway recommendations to be submitted later this year to the White House and to the state governors.



Office building goes round and round



Capitol Records, Inc., has approved plans for a $2-million office building in Hollywood, Calif., that will look a lot like a big stack of the company's products on a record player. But Capitol says economy and functional efficiency—not appearance—were features that dictated the choice of the circular design.

Core facilities (stairs, elevators, toilets and duct shafts) in this building will take up only 14% of gross floor space compared with about 20% in conventional rectangular buildings. In addition, these core facilities will be equi-distant from all extremes of the building.

Capitol's new home will be 13 stories high—height limit for the Los Angeles area. A one-story base 82x180 ft will support upper stories 90 ft in diameter with 6,300 sq ft of enclosed floor area. Construction will be reinforced concrete.

The circular design also will make possible a saving of from 13% to 20% in construction of the perimeter wall. To enclose 6,300 sq ft only 280 ft of perimeter wall will be required, compared with 320 ft in a square building and more still for a rectangular design. The smaller wall area also will effect savings in heating and air-conditioning costs.

Architect for the building is Welton Becket and Associates, Los Angeles. Structural engineer is Murray Erick Associates, Los Angeles.

LABOR

. . . Drive to revise T-H

(Continued from page 21)

important reasons for construction's difficulties with T-H in his January message to Congress. (ENR Jan. 14, p. 27).

These were: Permit the making of contracts covering labor before the workers are present on the site; permit union-shop agreements reducing the time in which a worker must join a union from 30 to seven days; legalize some forms of what NLRB has ruled as secondary boycotts—specifically, refusal of union men on a job to work alongside nonunion craftsmen employed by another contractor.

The industry, of course, has many other points of disagreement with the law: The fact that there is, in effect, no "industry" in the sense that there is a steel or automobile industry, which makes it impossible to reach widespread general agreements; the itinerant or "casual" nature of much construction employment, which makes union representation elections nearly impossible.

Another point is that the peculiar organizational setup of the basic building trades, and the interlocking operations on the construction site often tend to make an NLRB decision in fact an assignment of work to a particular trade—which in turn begets further jurisdictional troubles.

• Board decisions show confusion—Further evidence of the difficulty of administering a law that its author admitted was written basically to cover other types of industries is shown by actions of the NLRB and the courts, under both Democratic and Republican administrations.

Almost immediately on passage of the law seven years ago, the board found itself confronted with knotty construction problems. It ignored them as much as possible, on the ground that the problems most often involved local matters. It did make a try, however, to hold an area election (around Pittsburgh), failed badly and gave up any further attempts at such elections from that time onward.

Over the years, NLRB actions and decisions have been confusing enough. Within the past nine months, for example, the board (operating for the first time with a Republican majority) has pointed up by its decisions basic differences between construction practices and those of other industries.

During the first nine months of 1954, the board hit hard at a standard industry practice—that of using a hiring hall or some variant of it. In 10 cease-and-desist orders issued, unions and construction employers have been ordered to end what it found to be illegal hiring practices.

(Interestingly enough, Robert Denham, first NLRB general counsel, in 1950 specifically OK'd the use of a union hiring hall at Nampa, Idaho (ENR July 13, 1940, p. 26).

In four of the 10 cases—which involved a long-standing battle between carpenters and machinists over jobs performed by millwrights—NLRB voided hiring agreements between carpenters and their employers; in two other cases, carpenters and employers in Suffolk County (Long Island) and Herkimer, N. Y., were ordered to dissolve hiring agreements.

• Points up difference—Some of the other cases considered by NLRB during the nine-month period spotlighted another major difference from other industries: The part played in construction by lower-echelon supervisory employes in carrying out hiring agreements; and the dual loyalty of foremen who are in most cases also union members.

In most other industries, Taft-Hartley's deliberate separation of foremen from rank-and-file in bargaining groups is quite effective. In construction, not so. In fact, in construction, the "typical unit of representation"—the group working under a foreman in a plant—does not, and in many cases cannot exist.

• It adds up—A survey of the board's actions over the years, plus those of both sides of the industry, makes it very evident that there is real ground for demanding change in the law.

It is obvious that NLRB and its general counsel have long been conscious of the difficulties of enforcing the law in relation to construction. At one time, in fact, the general counsel suggested to the board that it act on its own to make a special exception of construction hiring agreements.

One NLRB trial examiner even included the remark in an opinion that unions and employers in construction view the board orders as "mere business expense and inconvenience."

• Change wanted—The construction unions in general have not joined the labor clamor against T-H as a "slave act"—they've been concentrating on their so-far-unsuccessful attempt to get the law changed to conform to long practices of the industry, and with regard to its special nature.

If they follow Gray's suggestion, which would in effect turn the law on itself, they may have hit on a device of sufficient nuisance value to force some changes. But general and specialty contractor groups also are much interested.

A good summary of employer reaction to proposed changes was evident in testimony in April 1953 (ENR April 23, 1953, p. 28) before a Senate Labor Committee then considering revisions to the T-H law.

The consensus of testimony by such groups as the National Constructors Assn., and the Associated General Contractors was that they had no objections to some form of union shop or compulsory union membership—if they could, in turn, get some protection against jurisdictional strikes. Another point of employer objection: Bans against the industry-wide bargaining, which contractors feared might strike (on strict interpretation) against the long-standing practice of area bargaining.

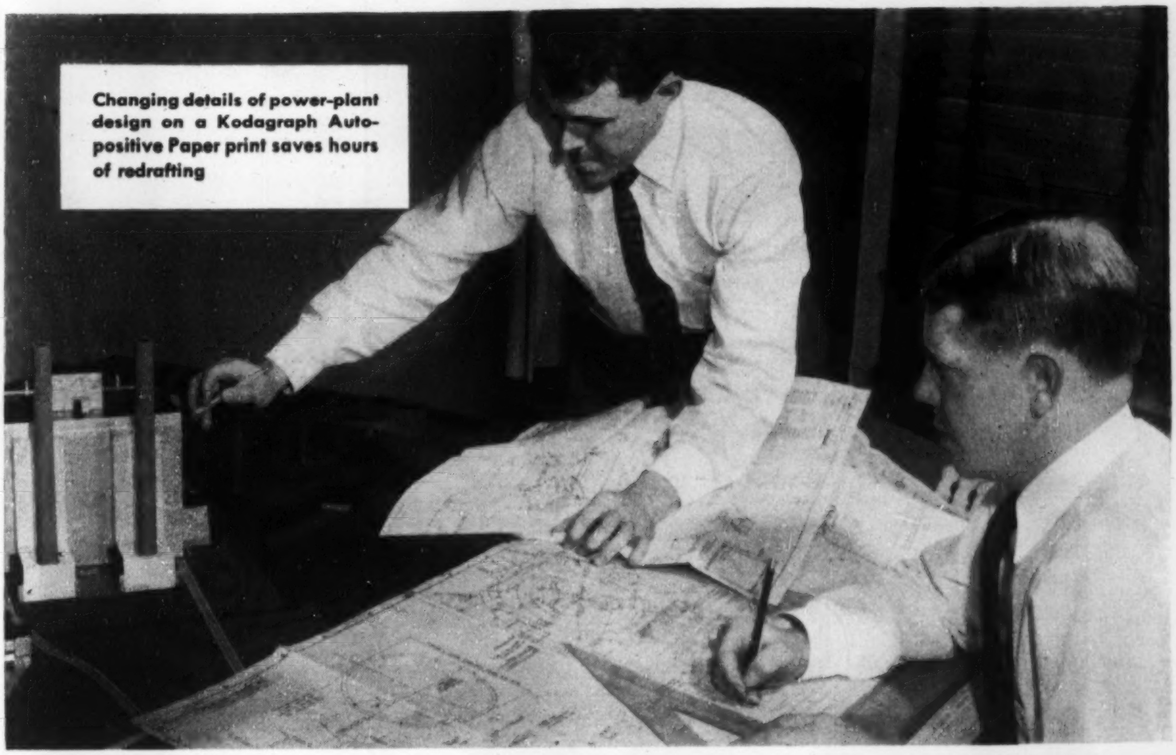
As most observers see it, the wanted changes can come two ways—both based on political pressures: Changes by NLRB that will in effect change the law; or specific changes written in by Congress.

Either way, the pressure for it will certainly mount until the November elections.

Labor briefs . . .

• Repeal move due—A proposal for repeal of Nevada's "right to work" law (which prohibits the closed shop and cumpulsory unionism) has been certified by the Nevada Secretary of State and will be submitted to voters in November. The existing law was approved by voters in 1952.

• To joint board—A "wildcat" strike over jurisdiction between millwrights and iron workers has been referred to the National Joint Board for Settlement of Jurisdictional Disputes, after it had interrupted construction of the $175-million Indiana-Kentucky Electric Company's power plant (to supply power for AEC installations) near Madison, Ind.



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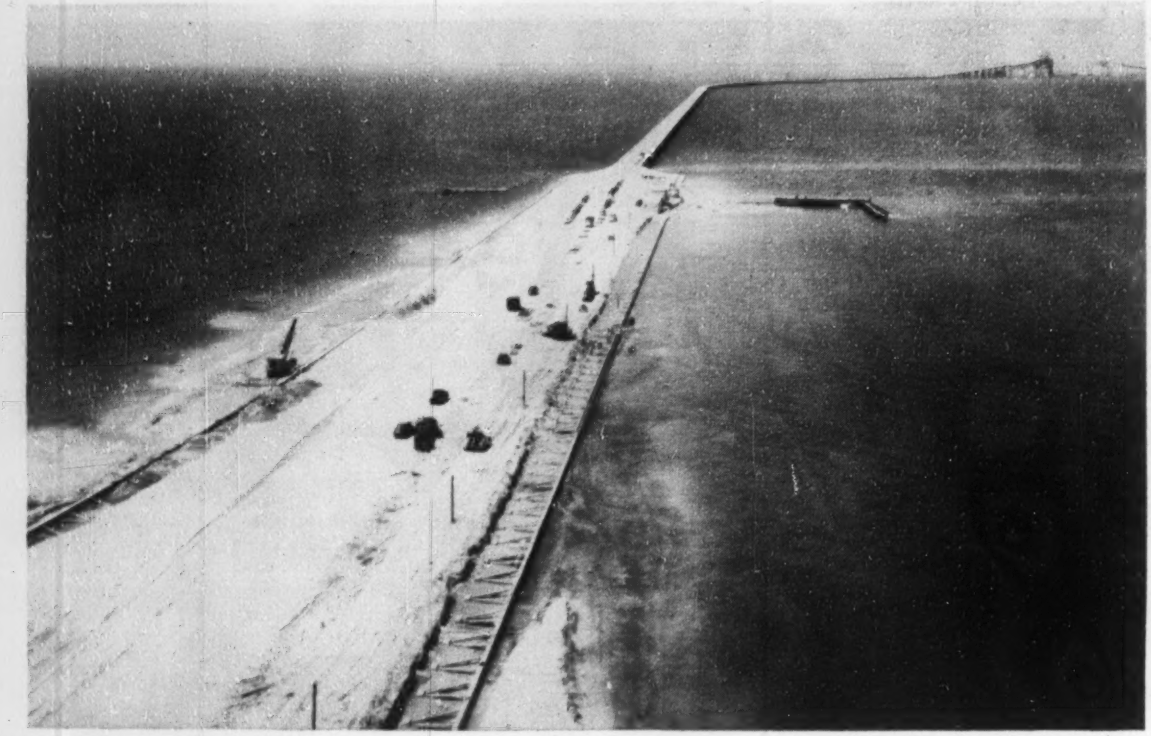


SUNSHINE SKYWAY—Only one-fith of the project is in this view of fill, prestressed trestle and main-channel crossing.

Postscript on a construction story:

Bridge to double region growth rate; . . .

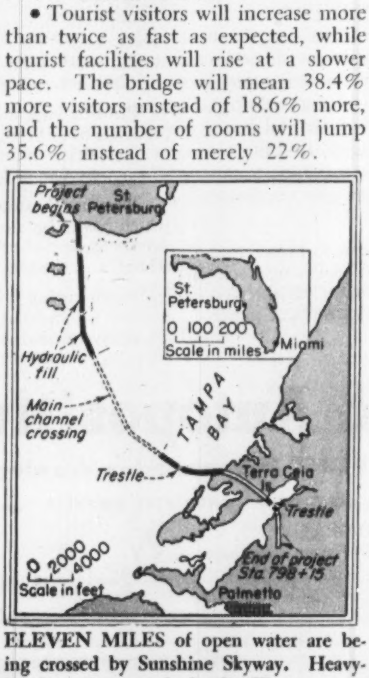
Twenty-two million dollars worth of bridge will begin carrying toll traffic next week across Lower Tampa Bay, and already thousands of Floridians are satisfied that the money is well spent.

Their satisfaction stems from more than mere confidence that the 15-mile Sunshine Skyway will pay for itself: they've had a look at an economic report that shows how this one project will put extra dollars in their own pockets—how it will step up the already-gratifying rate of economic growth along Florida's Gulf Coast.

Prepared for Florida Power Corp. by First Research Corp. of Florida, a Miami consulting firm, the economic study foresees that the bridge will almost double expansion rates in various fields.

During the next five years:

- Population will increase 31.8% instead of 17.5%.
- Retail sales up 31.7% instead of 14.8%.
- Bank deposits will gain at almost triple speed—43% instead of 15.8%.
- Auto registrations due to increase 39.2%; would have been 22% without bridge.
- Non-agricultural employment up 31.7% instead of 14.5%.
- Tourist visitors will increase more than twice as fast as expected, while tourist facilities will rise at a slower pace. The bridge will mean 38.4% more visitors instead of 18.6% more, and the number of rooms will jump 35.6% instead of merely 22%.

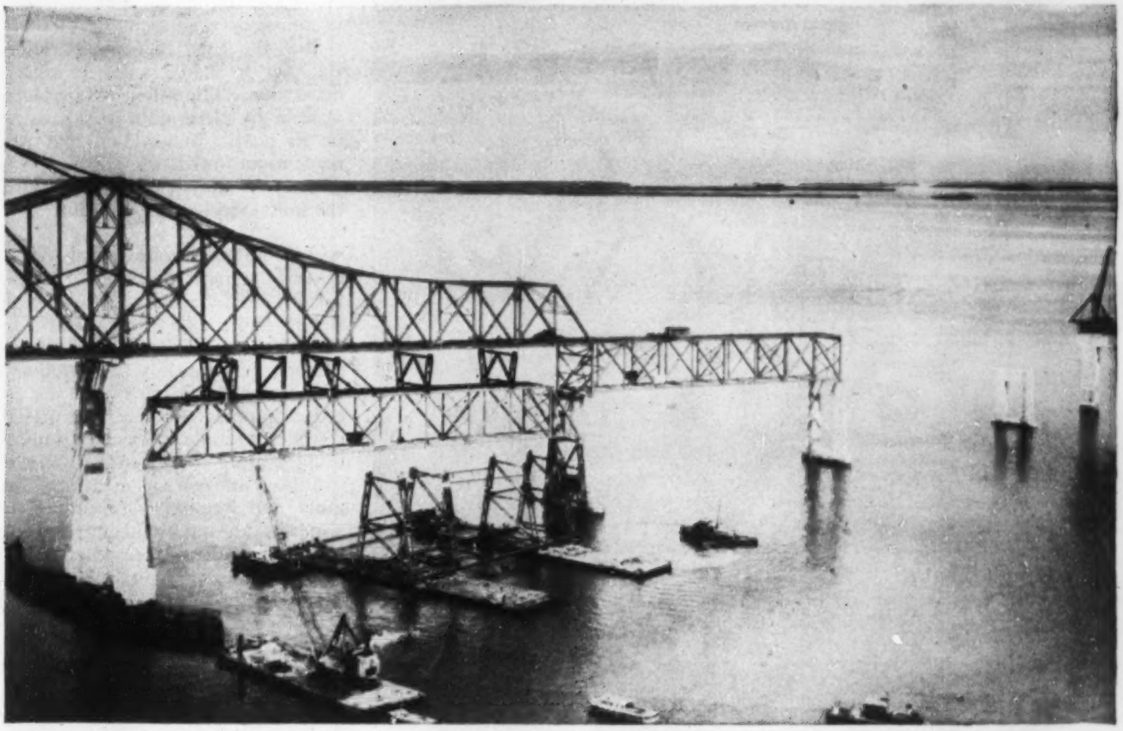


ELEVEN MILES of open water are being crossed by Sunshine Skyway. Heavy-lined portions are hydraulic fill.

Ten counties will be benefitted by the bridge—coastal counties ranging from Citrus, 100 miles north of the bridge, to Collier, 160 miles southward. The effect becomes pronounced in peninsular Pinellas County, particularly in county-seat St. Petersburg, and continues strong throughout the counties below the bridge. Sarasota can expect the largest growth in the latter counties during the five-year period covered by the study.

An idea of what this growth means in dollars may be inferred from an estimate that retail sales in the 10-county area last year were $714 million. With the bridge, the figure in five years should be 31.7% more, or $940 million; without the bridge, only 14.8% more, or $820 million. Hence, Sunshine Skyway could be credited with $120 million worth of extra retail business in five years.

- **Idea born in 1920**—For many people, then, next week's bridge opening is the beginning of a new and gilded era. Now past are 30 years of bridge promotion and four years of actual construction. A West Coast highway was first sponsored by a Good Roads meeting at St. Peters-



TRUSS IN DOUBLE ROLE—Truss in falsework below cantilever bridge anchor arm has served its initial purpose and is about to be picked up by barges for transfer to its final resting place—on twin-shaft deck-truss piers at right.

. . . steel erection ends open-water work

burg in 1920. Crossing the lower bay was essential to completion of this route, which gives midwesterners direct access to all the Gulf Coast playground spots.

In 1924 a ferry service was begun, and in 1927 first engineering studies of a bridge crossing were made. Sponsorship of the bridge gravitated to the State Road Department, and in 1949 the department engaged Parsons, Brinckerhoff, Hall and Macdonald, of New York, to design the project. Traffic surveys by Coverdale and Colpitts, New York, had shown the crossing would pay for itself.

Construction, which began with hydraulic filling along non-structure portions of the location in 1950, is best-known for its prestressed-concrete elements—a total of 17,424 ft of the two-lane roadway is supported by 48-ft prestressed-concrete trestle stringers. (This was the first mass-production application of prestressing in the United States, and it was described in ENGINEERING NEWS-RECORD Feb. 26, 1953, p. 36. The article also detailed production methods for precast conventional concrete trestle deck units for another section of the crossing, and it presented a general description of the over-all project.)

As shown on the map, roadways on hard ground and hydraulic fill account for 10.2 miles of the 15-mile total. The prestressed and conventional concrete trestles add 3.8 miles and the remainder is steel structure, including a fixed low-level span over a small-boat channel, a twin-leaf bascule bridge and a high-level cantilever bridge crossing the main ship channel into Tampa Bay.

• A postscript—Erection of the cantilever bridge, which took place during the past year, would be a major construction story under other circumstances. On this project, overshadowed by the significance of the prestressing work, steel bridge erection comes as a postscript.

Total length of the main-channel steel bridge is 5,621 ft, consisting of the cantilever bridge (main span 864 ft, anchor spans 360 ft, affording minimum underclearance of 141.5 ft), with symmetrical north and south approaches rising at 5% grade from the flanking concrete trestles. The approaches each contain two 290-ft deck trusses, six 140-ft deck-girder spans and six 100-ft deck-girder spans.

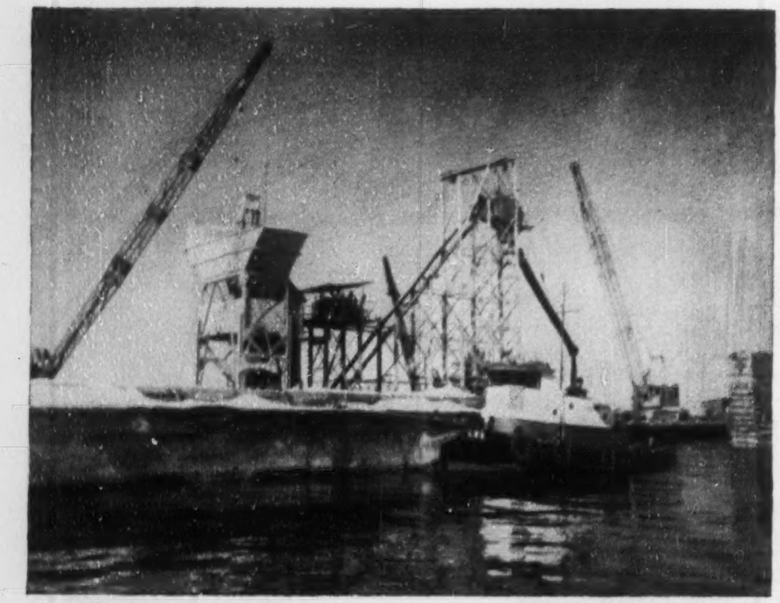
Deck girders were installed from the two trestles inward toward the channel, by cranes traveling on the girders. All south-approach girders were placed, but the last one on the north approach was omitted temporarily.

This omission was part of the erection plan, which involved floating-in for the four deck trusses, and the use of one of the deck trusses in falsework for the cantilever-bridge anchor spans.

An assembly stage supported by four H-pile bents was built in shallow water alongside the last two girder spans at the south approach. Adjustable steel towers mounted on the stage supported assembly at the correct installation height for each deck truss, all assembly-lifting being handled by the traveler that had placed the south-approach girders.

When each of the first three trusses was assembled to its full length, two steel barges were slipped between the first and second, and third and fourth H-pile bents. Barge buoyancies were increased to effect transfer of tower and truss loads to the barges, and the now-floating load was moved by tugs

(Continued on page 32)



FLOATING CONCRETE PLANT, here shown at work on main-channel crossing foundation pier, escaped hurricane in 1952. Four other rigs were sunk, one by U. S. Coast Guard gunfire 200 miles at sea, where it was deemed a navigation hazard.

INTRACOASTAL WATERWAY intersects project at break in fill nearest St. Petersburg. Bascule leaves were fabricated in Hendry Corp. yard at nearby Rattlesnake.

. . . Barges place trusses

to position on bridge piers. Towers were detached from the truss and floated back to the assembly stage.

The fourth deck truss was assembled with two extra panels, so it could be incorporated in the falsework for in-place erection of the anchor spans. Falsework bents were erected atop the truss, to establish the proper grade for anchor-arm lower chords, and the assembly was picked up and floated between the south anchor-arm piers. The truss rested on falsework bents supported by pier pedestals. When south anchor-arm erection was complete the derrick continued erection by cantilever methods inward toward the middle of the main span, and the falsework truss was moved to the north anchor-arm location where it was used to support erection there.

During the third and final move, after the truss had wound up its service as a falsework element, one of the extra panels was removed. This permitted the truss to come to rest on the pier it shared with its adjacent deck truss. The other extra panel remained in place until the truss was on its piers. Removal of that panel made room for the last north-approach girders, which had been omitted from the initial steel-erection routine.

• Open-water hazards real—As on other open-water bridge projects, notably Chesapeake Bay Bridge (ENR Sept. 27, 1951, p 42), one of the objectives of the floating-in erection techniques was reduction of open-water hazards. Under the procedure adopted, for the most part the contractor could pick his time for using floating equipment.

Shore-yard casting of trestle deck units and prestressed trestle beams also was an important factor in reducing the hazards, but when it came to foundation work the elements had to be faced squarely. A look at the equipment casualty toll of an October 1952 storm leaves no doubt as to the reality of the dangers. Seventeen barges and four crane rigs sank. One of the latter, found 200 miles out in the Gulf of Mexico, had to be sunk by the Coast Guard as a menace to navigation. Two, however, were recovered. One floating item that survived, a concrete plant, is shown here at work on an approach pier for the main-channel bridge.

• Seawalls built—Hurricanes of course were taken into account throughout Sunshine Skyway design. Wind loadings as high as 75 psf were used for some structural members, and precautions were taken against normal storm and tidal damage to the hydraulic fills. Precautions include riprap at and near some bridge abutments, and seawalls in the vicinity of others. However, the designers count on these protective measures only for reduction of hurricane damage. The 24-ft roadway is 7½ ft above mean low water; it is flanked by 8-ft stabilized shoulders, and the remainder of the filled material will be covered with shrubbery.

• Management—Resident engineer for Parsons, Brinckerhoff, Hall and Macdonald throughout the project has been Peter A. Hakman. American Bridge Division, U. S. Steel Co., built the main channel bridge superstructure and Hardaway Contracting Co., Columbus, Ga., built the foundations. Hardaway also was the contractor for the prestressed portion of the project, and Hendry Corp. Rattlesnake, Fla., built the pre-cast-slab trestles and the bascule bridge.

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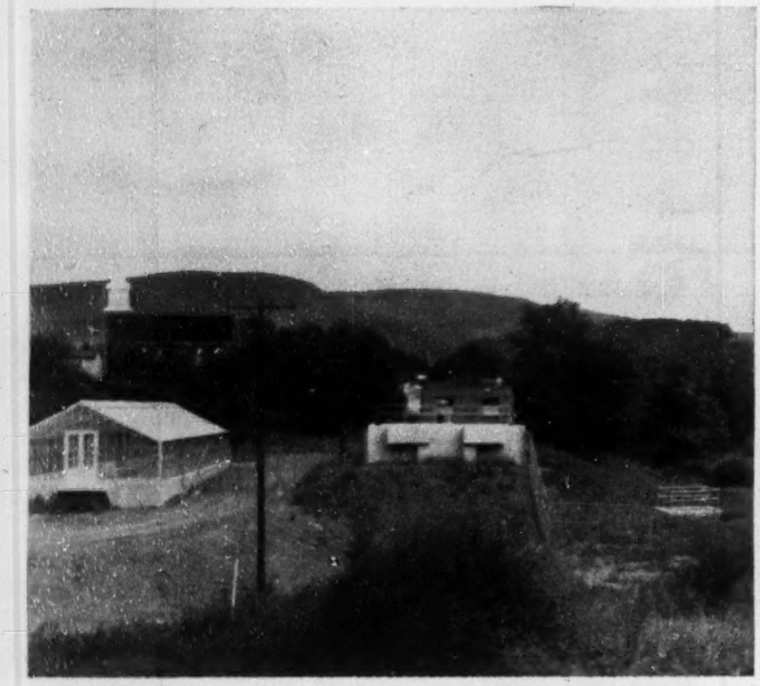
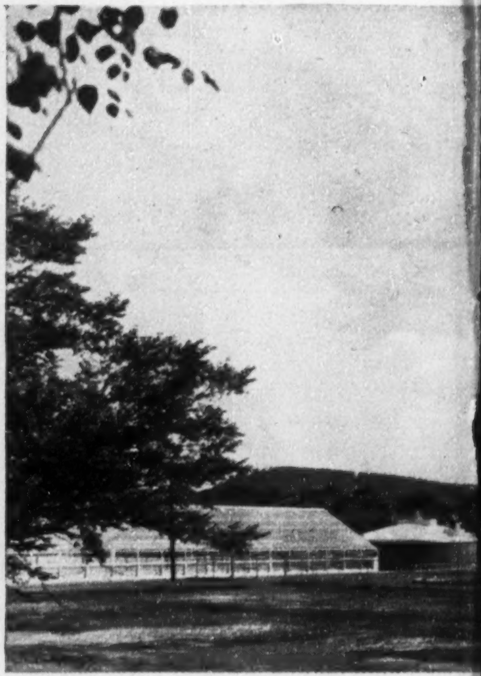


NO DOWN PAYMENT $7,783 per year will buy this primary sewage works for Catawissa, Pa., under Pennsylvania's system of financing.



$23,448 YEARLY will buy this plant for the city of Danville,

Installment buying of sewage plants

How it works with Pennsylvania's authority financing and state subsidy of construction

Samuel I. Zack
Gannett Fleming Corddry and Carpenter, Inc.
Harrisburg, Pa.

The device of setting up local authorities to get around limitations on size of municipal debt has done a lot to encourage construction of sewage treatment plants in Pennsylvania. Nearly all such plants that have been built there recently or that are now being built are financed under the Municipal Authorities Act of 1945, which gives local authorities the power to sell revenue bonds, and to collect revenues in the form of sewage service charges to pay off principal and interest on the bonds, as well as meeting operating expenses.

Besides actual construction costs, bond issues of local sewage authorities have been made to cover:

Engineering costs, real estate and rights-of-way, legal counsel and bond counsel, printing the indenture, trustee's initial fees, administrative and operating expenses or working capital for the authority, initial debt service reserves, interest during construction and contingencies. In other words, a newly created local authority is able to finance its entire operation through its bond issue, based on estimated future revenues.

Receiving of bids for construction and awarding of construction contracts must be timed to the sale and delivery of bonds, so that commitments and credit become effective practically simultaneously.

In a paper presented before the Sanitary Engineering Division of the American Society of Civil Engineers in June, revenue bond financing for eight Pennsylvania municipalities was detailed. Figures given here for the same eight municipalities are taken from that paper.

• Mechanics of financing—A trust indenture setting forth requirements for securing the venue bond issue is generally executed between the authority and a trustee in behalf of the bond purchasers. The indenture calls for revenues from sewage service charges to cover administrative, operating and fixed charges. Generally, the completed projects are leased back to the municipality for operation, maintenance and collection of revenue. Sometimes the authority maintains management and operation.

In every case, financing is set up so that the average of anticipated annual receipts from sewer rentals will be greater than the annual operation and maintenance expenses and average debt service, plus authority expenses, by a substantially safe margin. Thus, surplus funds are accumulated. These are primarily to supplement deficits in revenue needed to meet annual disbursements, or to establish a reserve for emergency repairs and replacements, or to expedite bond redemption, or for improvements and additions to the project. Surplus funds from sale of bonds not used for initial construction also become available for reserves and for bond redemption and improvement funds.

Each bond indenture makes provision for the sale of additional and supplemental bonds, as required, with some means for getting extra revenue to service and amortize such supplemental bonds. The supplemental bonds have been resorted to in extending the original project or meeting unforseen contingencies.

• Service charges—Authority income, with which the investment is paid off, must be set by local ordinance establishing the sewage service charges.

Pa. The plant has facilities for the primary treatment of 1.3 mgd of sewage.

ANNUAL FIXED CHARGE averaging $19,491 to the city of Gettysburg, Pa., will pay for complete treatment of 1 mgd.

Such an ordinance permits placing of liens against owners of properties for failure to pay such charges; next to taxes such liens have priority over any other claims against the properties.

To put the authority in business—before facilities are built upon which service charges can be based—connection charges are generally made. Where a municipality has an existing sewerage system, this is deeded over to the authority and collection of service charges can be started in advance of completion of new facilities.

Sewer rentals in Pennsylvania municipalities are based either on metered flow or a fixture count where meters do not exist. Surges are added for unusual strength of waste as measured in suspended solids and BOD. (Exact bases for charges in the municipalities taken as examples given in ASCE paper referred to above.)

This much can be generalized: Industrial establishments pay a minimum per employee irrespective of the rental payment based on fixtures or water used. These minimum rentals range from 50¢ to $1.50 per employee. Sewage service charges for schools based on the number of pupils attending range from 30¢ to 75¢ per quarter per pupil. (Other schools have been charged on fixtures or meters.)

Estimated average annual sewer rentals for complete new facilities are about $30 per dwelling unit, even where the period of bond is 40 years. Where sewerage systems already existed, charges are less than $25 per dwelling unit per year with bond issues of 30 years or less.

• **Making payments**—Fixed payments made under the indenture have to be such that revenue received during initial years will be sufficient for making these payments as they become due. Therefore, estimates have had to be made of annual requirements for interest, amortization, reserve funds and authority expenses.

Municipalities which lease their

(*Continued on page 36*)

Authority bond financing—How it has worked in 8 cases

Authority	Bonds Issued	Date of Issue	Interest Rate	Years To Maturity Total Issue	Bond Price	Average Years Total Issue	Actual Avg. Rate of Interest[3] (Calculated)	Total Interest During Life of Bonds	Average Annual Fixed Charges[4]	Fixed Charges Under Indenture 1953	Fixed Charges Under Indenture 8th Year
Mechanicsburg....	1,040,000 B	6/1/49	3¼–3⅜	40	97.50	26.70	3.515	$952,250[3]	$61,138	$60,100	$68,000
	250,000 B	6/1/50	3⅛	40	97.50	25.22	3.300	203,281[3]			
Lemoyne........	880,000 B	5/1/49	3¼–3½	40	100.00	25.90	3.490	794,775	$49,348	$53,515	$55,721
	135,000 B	5/1/50	3¾	40	100.00	32.41	3.750	164,163			
Middleburg......	475,000 B[1]	4/1/51	2¾–2⅞	40	100.00	26.02	2.789	344,706	$20,492	$15,200	$23,500
Bloomsburg.......	1,250,000 A	4/1/51	2½	30	99.00	18.44	2.580	588,750[3]	$61,292	$74,656	$74,656
Gettysburg.......	475,000 A	10/1/51	2⅝	40	100.18	24.56	2.606	304,666[3]	$19,491	$24,200	$24,200
Danville.........	475,000 B[2]	2/1/52	1⅞–2–3	27	100.08	16.50	2.015	158,083[3]	$23,448	$32,000	$32,000
Shippensburg.....	1,300,000 B	4/1/52	2½–2⅝ 2¾–2.8	40	99.00	25.99	2.773	927,418[3]	$55,685	....	$72,300
Catawissa.........	150,000 B	5/15/52	2¼–2½	29	100.00	18.45	2.731	75,712	$7,783	$10,300	$10,300

A—Operated by Authority.
B—Lease Back to Borough for Operation.

[1] Borough guarantees $2500 per year from tax revenue.

[2] Borough guarantees to make up deficits from tax revenue.

[3] Allowing for premium or discount on bonds.

[4] No adjustment for initial interest from bond issue.

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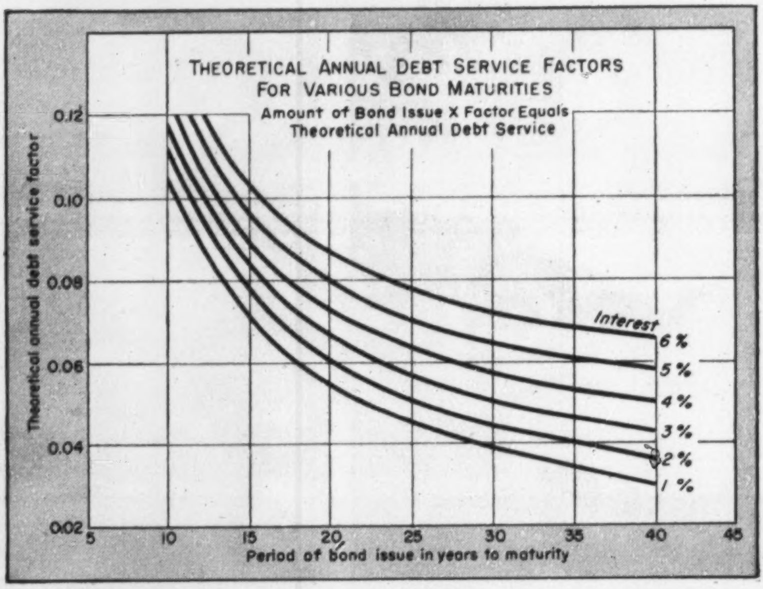

sewerage system from a local authority are required by the indenture to deposit with the trustee either quarterly or semi-annually a fixed amount of funds taken from sewage service revenues for use by the trustee to pay interest and principal of bonds, for expenses of the authority and trustee and for establishment of debt service reserve and maintenance reserve funds. Under the lease back arrangement the municipality pays the operating expenses (including admistration) out of its revenues. After making the required fixed payments to the trustee and after paying annual operating expenses, surplus funds must be deposited with the trustee for use first to make up deficits in any of the established funds and then for bond redemption, improvements and extensions.

• **State subsidy**—Pennsylvania has a new law under which it will pay to cities a subsidy annually amounting to 2% of construction cost of intercepting sewers and treatment plants which have been built since 1937. This includes plants that will be built in the future under order from the Pennsylvania State Water Board.

The municipality can use this subsidy as income to meet expenses of operation or as additional annual fixed payment toward interest and amortization, or to reduce sewage service charges.

Bond houses and bond counsel have considered this subsidy as income over and above any revenue from sewer rentals. Thus, projects otherwise not considered acceptable as sound investments because sewage service charges to finance them would have to be too high, have become acceptable when the subsidy has been taken into account. For the eight cities taken as examples here, the subsidy amounts to somewhere between 40% and 55% of annual operating expenses—72% in one extreme case.

• **Role of consultants**—The consulting engineer working with a Pennsylvania municipality on authority financing of sewage works must certify that all the amounts estimated in the bond issue to be set aside for various purposes are sufficient in his opinion. The same certification is required in the event additional bonds have to be issued. The consultant must supervise construction and approve all payments to contractors. Later, he must annually certify that in his opinion the schedule of rates and charges in effect is sufficient, the project is in a proper state of maintenance and repair, and reasonable amounts of fire and casualty insurance are carried by the authority or municipality, whichever is operating the plant.

In some instances, the consultant is required to make a general inspection of operating records and policies and to suggest changes. He must certify as to proper expenditure of reserve funds established for maintenance and repairs, for additions, extensions or improvements.

It may be concluded generally that bond purchasers do not consider authority bonds for sewage projects as particularly risky. Generally, the public has not opposed connection charges nor sewage service charges. Experience of collections as against billings may be considered to be good. In most cases, there has been no trouble meeting annual payments and setting up required reserves.

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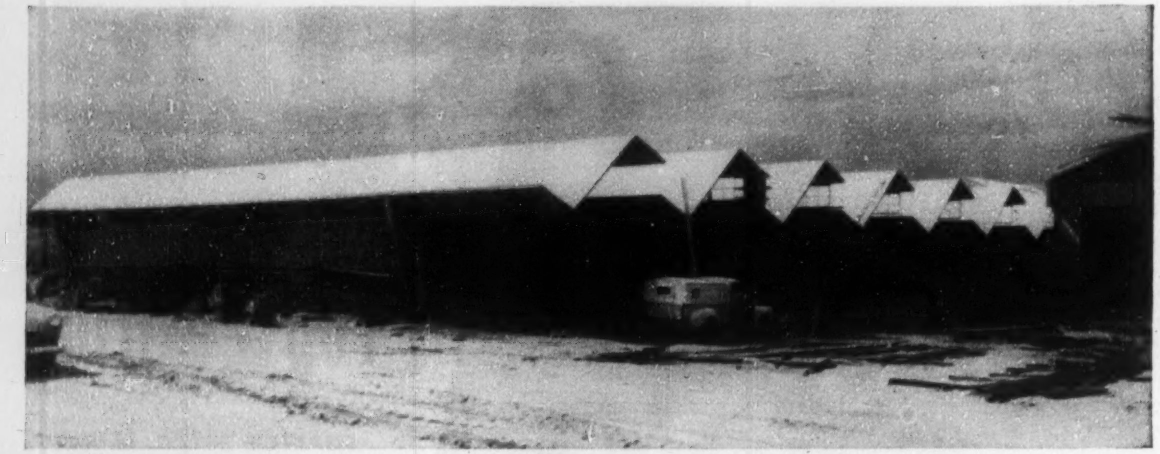
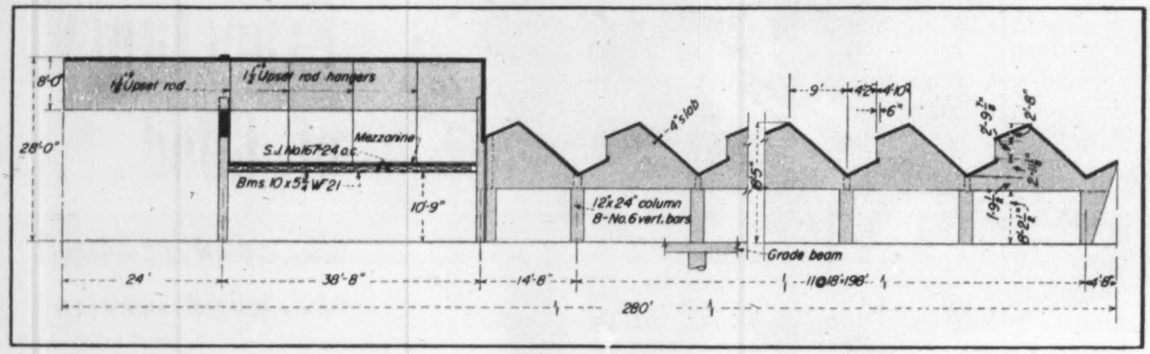


Z-SHAPED SECTIONS of reinforced concrete form a folded-plate roof over the office section of a Denver building.



FOLDED PLATES composing the Z roof are 4 in. thick, span 75 ft. Mezzanine (left) is hung from inverted-V type roof.

Concrete plates form low-cost factory roof

Milo S. Ketchum
Consulting Engineer
Ketchum and Konkel
Denver, Colo.

Concrete roofs of folded-plate construction, though only 4 in. and 6 in. thick, span 75 ft and 80 ft, respectively, in a new building for H. W. Moore Equipment Co. near Denver. Construction costs proved to be relatively low.

This type of roof, consisting of a series of plane surfaces inclined to each other, has also been called "hip roof" or prismatic shell. However, the Germans call it "Faltwerke"—literally, folded construction. This name is preferable to hip, which denotes a conical-shaped construction at the ends of pitched roofs.

• Why this design was chosen—It was feasible to consider long-span reinforced concrete construction for the Denver building because of the lower fire-insurance rates obtainable. Fire-insurance cost was an important consideration, since the site is outside city limits, which places the building in a high-rate zone, and the shop will house large pieces of expensive equipment containing inflammable liquids. Preliminary studies indicate that reinforced concrete would save about $1.50 per sq ft of floor area.

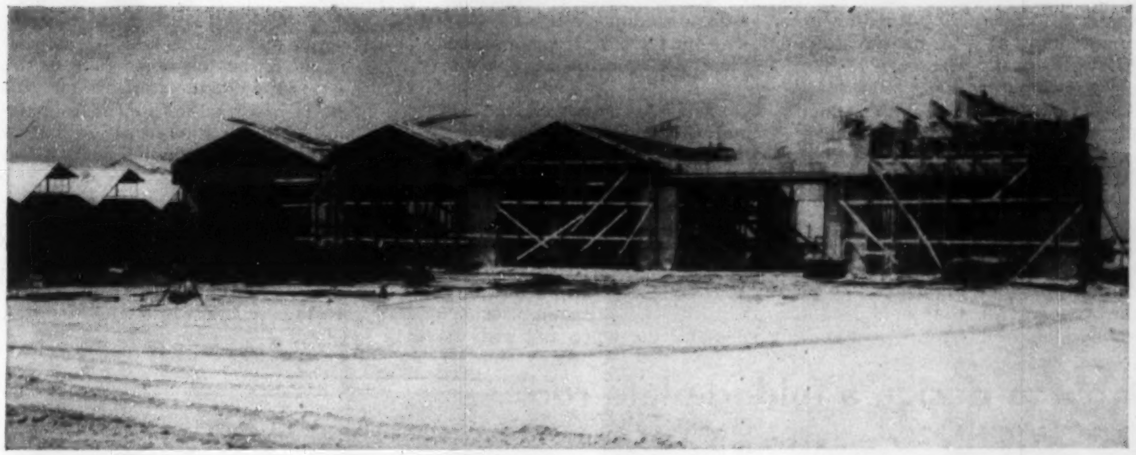
The shop required heavy bridge cranes, which would have to span 80 ft unless the cranes were supported by the roof framing. Therefore, a reinforced concrete folded-plate system was considered, because it has the ability to carry concentrated loads directly on the shell—an advantage over cylindrical shells. In the office and display area, this characteristic of folded plates was utilized again, when a mezzanine was suspended from the roof.

• Two roof shapes used—To meet different requirements of span and loading, two types of folded plates were employed for the building, which consists of (1) an office and parts area, (2) a shop area for repair of construction equipment and (3) a display and utility area. While the three sections required different roof treatments, esthetics demanded that the structures be integrated architecturally.

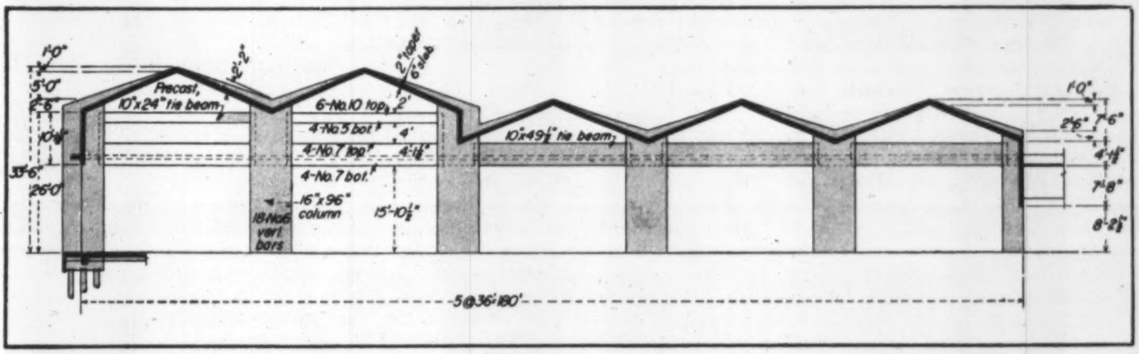
The roof over the shop consists of concrete plates joined together to form a series of inverted V's, with columns spaced 80 ft on centers along the valleys. Distance between valleys is 36 ft. Thickness of plates is only 6 in., except at supports, where the thickness is increased slightly for shear.

The display area roof is similar to the shop roof except the span is 40 ft.

Over the office and parts area, concrete plates are interconnected to form a series of Z's, with a northlight clerestory between successive units. These shells are 4 in. thick, though the span is 75 ft and overhangs cantilever 22 ft at each end.



V-SHAPED SECTIONS compose the roof over the shop, concrete for which was placed on movable steel and wood forms.



THIN-SHELL ROOF SLABS 6 in. thick span 80 ft over the shop. Tie beams between the columns carry the thrust.

• How folded plates act—The folded plates behave essentially as tilted plate girders in the long direction. However, longitudinal stresses at the junctions of plates must be the same in both members. In the short direction, each plate is designed as part of a continuous concrete slab. In a typical Z slab, for example, there is tension at the bottom of the main plate, but stresses in the side plates are completely reversed, indicating that the side plates act merely as restraining members for the deep plate girder.

The effect of deflections on transverse slab bending stresses must be taken into account. Computation of the correction for deflections is similar to that for sidesway in rigid frames.

Another fact worth noting is that outward thrusts of the inclined plates are large. For the shop roof, the maximum thrust is 300,000 lb. This force is resisted by transverse reinforced concrete stiffeners, or tie beams, on column lines. Wide columns permitted use of smaller stiffeners by taking the eccentric thrusts from the shells. However, the width of the columns was not dictated by the structural design but by the necessity for housing sliding doors.

Buckling in this type of structure generally is not of consequence because of the stiffness of the structural elements. However, an investigation was made of the flanges of the Z plates, including the effect of the eccentricity caused by transverse slab deflections. Results obtained by numerical methods through a series of approximations confirmed the hypothesis that there was no danger of buckling.

Transverse reinforcing in the plates, similar to that for a continuous slab, is arranged in two planes, to resist positive and negative bending moments. Longitudinal reinforcing, located for beam action, is closely spaced in the regions under tensile stress. In the shop roof, for example, No. 9 bars are spaced 2 in. c-c. During construction, it was necessary to space every fourth or fifth bar slightly farther apart to permit the vibrator spade to pass between the bars.

• Movable forms—Because of the unusual nature of the roof construction, the designers drew up complete designs for movable forms, which were incorporated in the plans as an option. The falsework consisted of steel trusses carrying wood joists. It was designed to be supported at four points and jacked into place, and to be removed and re-set by moving sideways. Also, a timber form that could be left in place for 28 days was provided along the center of each span.

Plans called for moving the forms at the end of seven days. The number of forms to be used was chosen so that jobs would be provided continuously for each crew. To determine when it would be safe to remove the forms, a check on the strength of the concrete was made by field tests for deflection of 3x3-in. by 5-ft-long concrete beams reinforced with one No. 3 bar having ¾-in. cover.

The contractor decided to use the prepared form design for most of the roof sections. However, he preferred ordinary wood forms for one end of the office and parts area and for the high bays of the shop. Also, some of the trusses were re-designed to give them constant depth, to improve their salvage value or permit re-use for other shell structures of different spans.

• Concreting on a steep slope—Design strength of the plate concrete was

(*Continued on page 40*)

specified to be 3,750 psi, with a maximum slump of 2 in. for the steepest part of the plates. There was no danger of too wet a mix being used, for the concrete would not stay on the slope if the water content was too high.

Concreting of the Z shells started at the top. Despite the steepness, the mix was restrained from sliding down by the closely spaced reinforcing. Continuous slab bolsters were arranged in vertical runs, because if set in horizontal runs, they would tend to hold the concrete, leaving voids on the lower side.

• **Close bidding**—When the plans were sent out for bids, it was expected that there would be a large variation in bids received because of the unusual construction. However, the architect and the engineer were surprised to receive four bids, with the highest and lowest only 2% apart and the three lowest bids within only 0.9% of each other.

Bid price for the entire building was about $9 per sq ft of total roof and mezzanine area. Included in this figure is the cost of cast-in-place concrete piles for the office and parts section, wood piles for the shop, concrete exterior walls, considerable office finish and radiant heating and cooling in the floor. Subsequent estimates for this type of construction applied to warehouses indicate a construction cost of $4.50 per sq ft, including heating and plumbing.

Tom Moore, of Denver, was architect for the equipment company building, and Ketchum and Konkel, of the same city, were the structural engineers. N. G. Petry Construction Co. was the general contractor for the project.

How to design a folded-plate roof

The folded plate is the simplest form of shell structure. An understanding of its structural action will assist in understanding the behavior of curved shells.

Basically, the shell acts as a beam in the long direction and as an arch in the short direction. This arch, however, is not supported at the ends, as is the usual two-hinged arch, but by shearing forces (actually the difference in shear stresses acting on opposite sides of a transverse element of the structure).

• **Folded-plate design**—In Fig. 1a is shown an element 1-ft-wide cut out of the folded-plate roof in Fig. 1b. This element carries a uniform load of 100 psf of sloping surface. It is supported vertically by the algebraic sum of the shearing forces acting on both faces:

$$(S + \Delta S) - S = \Delta S$$

Since the vertical component of the sum of the ΔS forces must equal the sum of the applied vertical forces, by inspection:

$$\Sigma \Delta S = 100 \times 10 \times 10/6 = 1{,}667 \text{ lb.}$$

The transverse bending moment at any section of the element is the moment about the section of the applied load on one side of it, less the moment of the ΔS forces on that side. The moment at the crown, noting that the ΔS forces act at the center of the section and go through the crown, thus producing no moment, is:

$$M = WL/2 = 100 \times 10 \times 8/2 = 4{,}000 \text{ ft-lb}$$

With the folded plate acting as a simple beam on a 40-ft span, the longitudinal bending moment is that due to the shear, ΔS, acting on a simple beam:

$$M = 1{,}667 \times 40^2/8 = 333{,}333 \text{ ft-lb}$$

The section modulus of the 120-in.-deep tilted girder is:

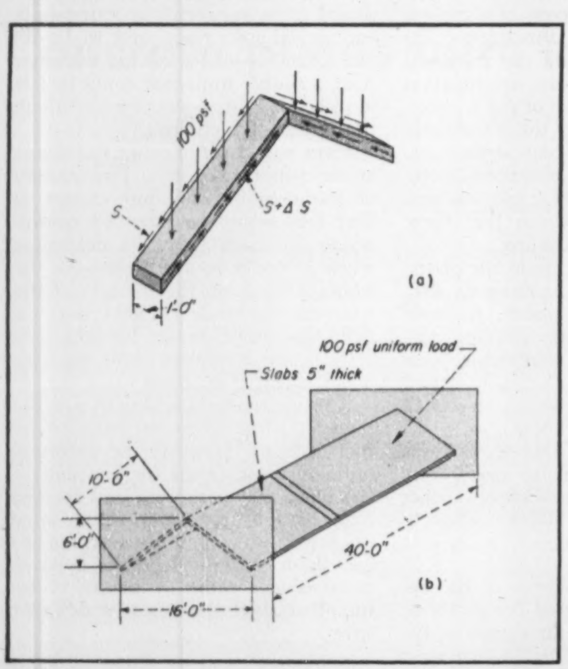
$$Z = I/c = bd^2/6 = 5 \times 120^2/6 = 12{,}000 \text{ in.}^3$$

Hence, the unit stress in the top or bottom fiber is:

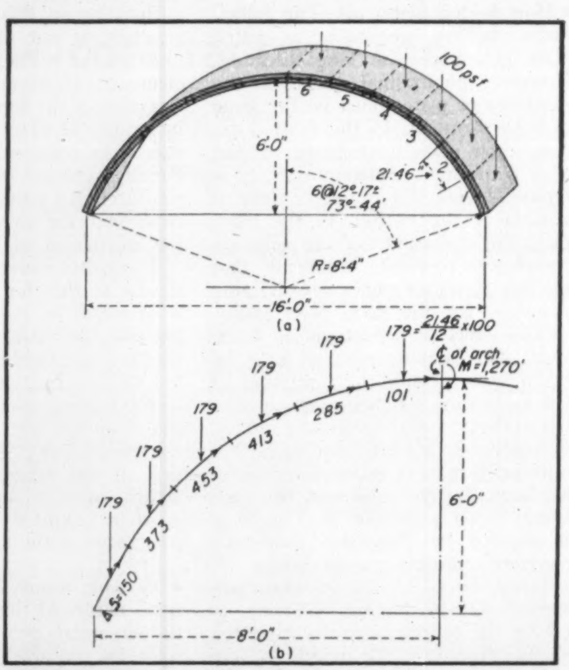
$$f = M/Z = 333{,}333 \times 12/12{,}000 = 333 \text{ psi.}$$

The preceding is a simplified version of the stress analysis for a folded plate. If several plates are interconnected, they act together to resist both transverse and longitudinal moment. A complete analysis, involving interaction of plates, is given in "Hipped Plate Construction," by George Win-

(*Continued on page 42*)



1 FOLDED-PLATE ROOF may be designed by assuming it to act as a beam in the long direction, an arch transversely.



2 CYLINDRICAL SHELL ROOF is similarly designed, but decomposed into 12 units for computation of stresses.

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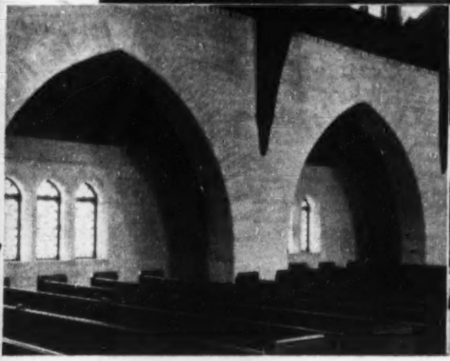

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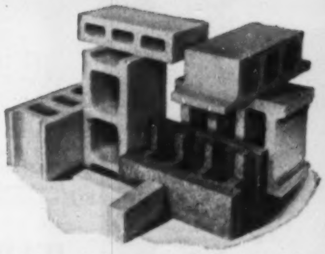

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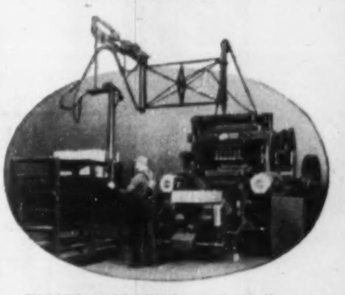

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ter and Minglung Pei, JOURNAL of the American Concrete Institute, Jan., 1947, p. 505.

• **Cylindrical shell design**—Analysis of curved cylindrical shells may be carried out in a similar manner. However, it is necessary to take into account not just two elements, as for the folded plate, but a large number of small plates. The distribution of shear forces, Δ S, is obtained from the unit shearing stress formulas for ordinary beam design.

A transverse element 1-ft-wide from a cylindrical shell is shown in Fig. 2a. Loading is the same as for the folded plate in Fig. 1b, and the overall dimensions of the structure are similar. Hence, the major difference is the curvature of the shell.

To compute the stresses, the arch is divided into 12 units, each 21.46 in. long. From the geometric properties of these, the section modulii of the curved section acting as a beam are found to be:

$$I/c \text{ (top)} = 11{,}930 \text{ in.}^3$$
$$I/c \text{ (bottom)} = 6{,}467 \text{ in.}^3$$

The total load on half the shell is:
$W = 6 \times 100 \times 21.46/12 = 1{,}073$ lb
from which the longitudinal bending moment is computed to be:
$M = 1{,}073 \times 40^2/8 = 214{,}600$ ft-lb
and the stresses in the top and bottom fibers are:

$$\text{Top: } f = 214{,}600 \times 12/11{,}930 = 216 \text{ psi}$$
$$\text{Bottom: } f = 214{,}600 \times 12/6{,}467 = 398 \text{ psi}$$

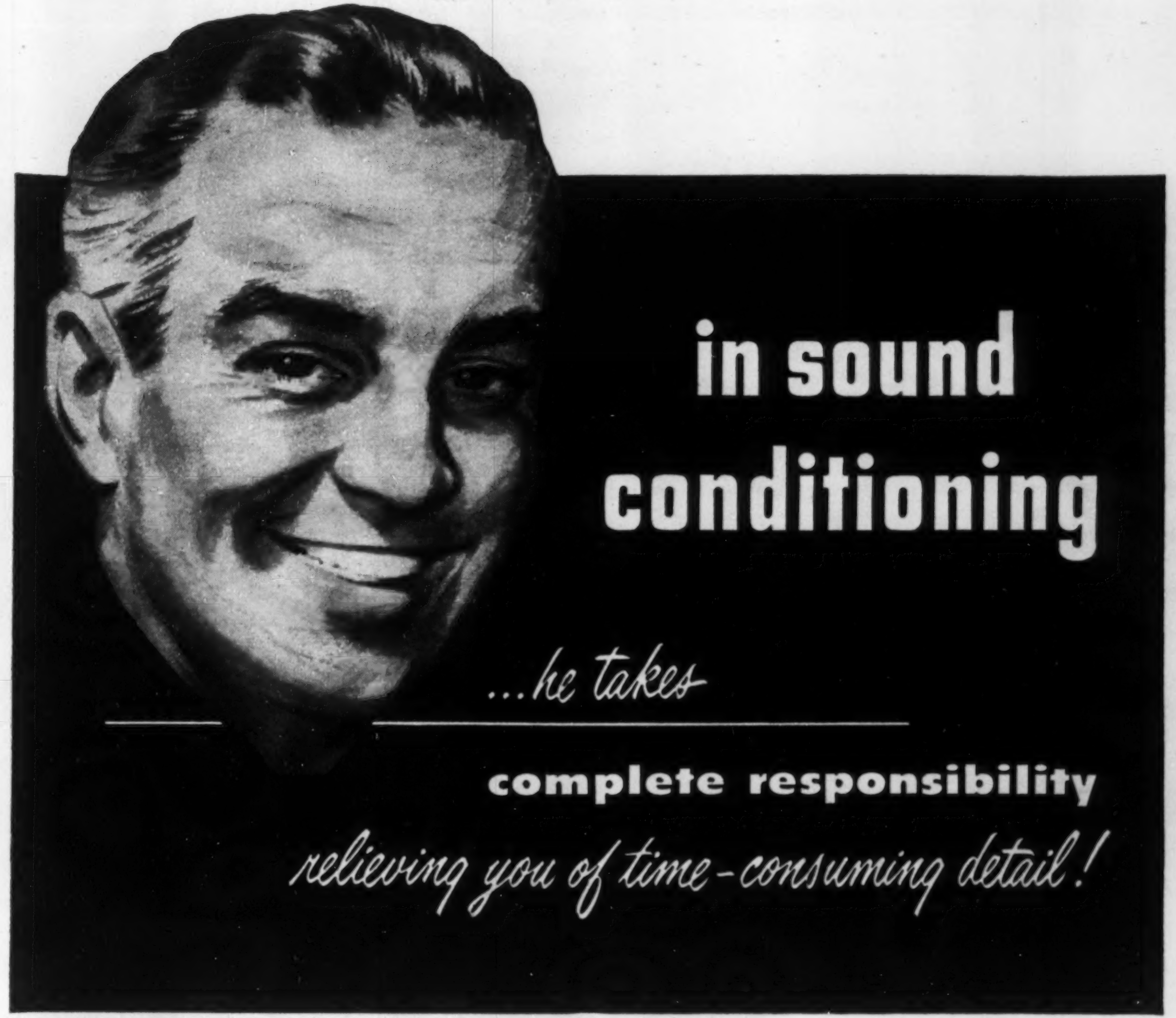
The shearing forces, Δ S, acting on each unit may be calculated from the standard formula for shearing stresses, $S = VQ/It$, where V is the total shear on the section, Q is the moment about the center of gravity of the areas on either side of the fiber for which the shear is to be computed, I is the moment of inertia of the section and t is the thickness of the section. For this element:

$$\Delta S = (\Delta V)\, Q/It$$

Values of ΔS computed for each element are shown in Fig. 2b. Each of these forces acts tangent to the curve. The net moment of the load and these forces about the crown is 1,270 ft-lb. This is considerably less than the transverse moment at the crown of the folded-plate roof.

If the curved shell had been connected to other shells, then an analysis similar to that for a continuous arch would have been necessary to obtain the transverse moments.

The preceding method of analysis for curved shells is satisfactory except when the radius is of the same magnitude as the span (see "Design of Cylindrical Concrete Shell Roofs," Manual No. 31, American Society of Civil Engineers).



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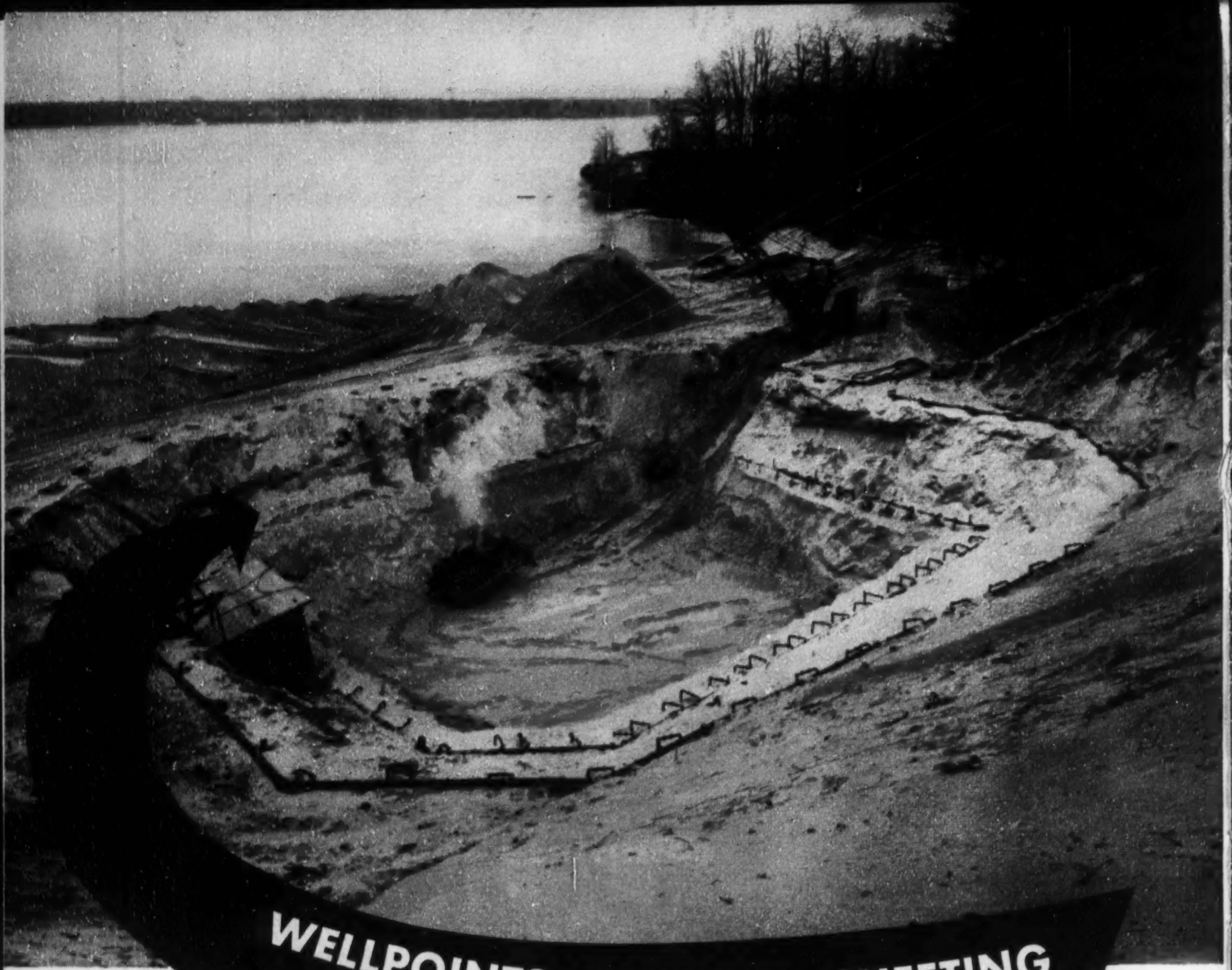

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A two-stage Moretrench Wellpoint System controls 24′ of water on this deep foundation for a pump station in Montague, Michigan. Material is fine sand with clay layers. No sheeting or bracing is needed. Contractor excavates with freedom and speed . . . in the dry!

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MUNICIPAL

City of 25,000 on drafting boards

$175 million project, representing bold step in community planning, will give Long Island, N. Y. a model industrial town

On what is claimed to be the largest contiguous tract of land assembled in the East under one ownership since the acquisition of the Levittown property that was used for residential purposes, a $175-million fully integrated industrial community is on the planning tables.

• **Some industry**—Slated to occupy a pie-shaped slice of Long Island, N. Y., 56 miles east of New York City, the 2,000-acre development will constitute a bold step in community planning. Suffolk City, as it is to be called, will devote 500 acres to industrial development, with one-third of the space allocated to large manufacturing plants, warehouses and commercial buildings. The remainder of the industrial area will be reserved for parking, walks and landscaping.

• **Some residential**—The largest portion of the property, about 1,200 acres in the northwestern section, will be devoted to a residential community with 6,000 one-family dwellings and 300 apartments that will eventually provide accommodations for an estimated population of more than 25,000 persons.

Most of the residential structures, built for the middle-income groups, will range in price from $8,000 to $10,000, but homes also will be provided in the $16,000 to $40,000 price ranges for the accommodation of managerial and executive employees of the community industries.

Apartment rentals are planned to start at $65 per month for three rooms and bath. In addition, a section of the residential community will be held in reserve for special housing requirements.

• **And community activities**—A total of 160 acres has been set aside for the construction of several shopping areas, where six individual supermarkets will be conveniently located to serve residents of all sections of the city.

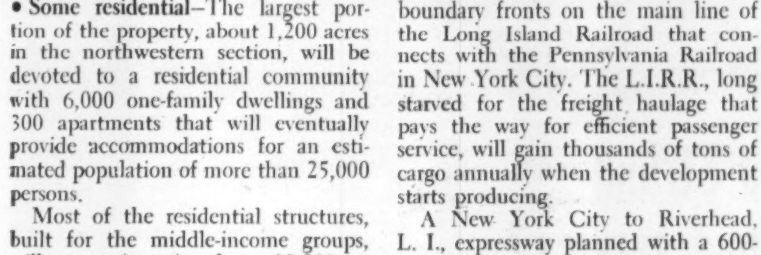
Also planned are 300 stores and shops of all types. Plans are under way, to provide recreational facilities such as theaters, restaurants and bowling alleys. It is estimated that total annual purchasing power of the community will reach $20 million.

More than 100 acres will be devoted to park and school uses. About half will be developed to use as a park in cooperation with the Suffolk County officials. The rest will be conserved for the construction of schools of all grades. Donation by the developer of lands necessary for churches will encourage construction of houses of worship for all denominations.

• **Convenient to transportation**—Approximately 10,000 ft of its southern boundary fronts on the main line of the Long Island Railroad that connects with the Pennsylvania Railroad in New York City. The L.I.R.R., long starved for the freight haulage that pays the way for efficient passenger service, will gain thousands of tons of cargo annually when the development starts producing.

A New York City to Riverhead, L. I., expressway planned with a 600-ft right of way from Manhattan's Midtown Tunnel to Riverhead, is more nearly assured with the advent of the industrial center that gives promise of being the first of many, according to planners.

Ten miles from the proposed development, plans also are under way for an ocean-front recreational development on Fire Island that separates this portion of Long Island mainland from the Atlantic Ocean. The development of this beach facility—Riviera Beach—also is more assured because of firm plans for going ahead with Suffolk City.



Development of Suffolk City has been fostered by a group of U. S. and Canadian businessmen headed by Sydney M. Siegel, Long Island realtor, who has been identified with other projects of commercial expansion in the area.

Says Siegel, "The need for a large industrial park with its own residential, commercial and recreational areas has long been evident. The rapid growth and development of Long Island have made it an ideal location for such a project.

"The population of Nassau and Suffolk Counties has tripled since 1930—and doubled since the start of World War II . . . The growth of industry has been equally phenomenal, with the number of persons employed in factories rising twelve-fold during the last 25 years, and with industrial payrolls rising 5,000 percent during the same period."

He goes on to assert that in spite of the rapid growth, the thought of commuting to New York City has been a deterrent to development in the central and eastern portions of the headland, and that projects like Suffolk City that obviate the need for long-distance commuting will signal birth of a new era for Long Island.

Brown & Mathews, Inc., have been named consulting and design engineers for the new center. Active in industrial development fields for more than 21 years, the firm currently is building industrial plants in Vancouver, Los Angeles, St. Louis, Toronto and Detroit.

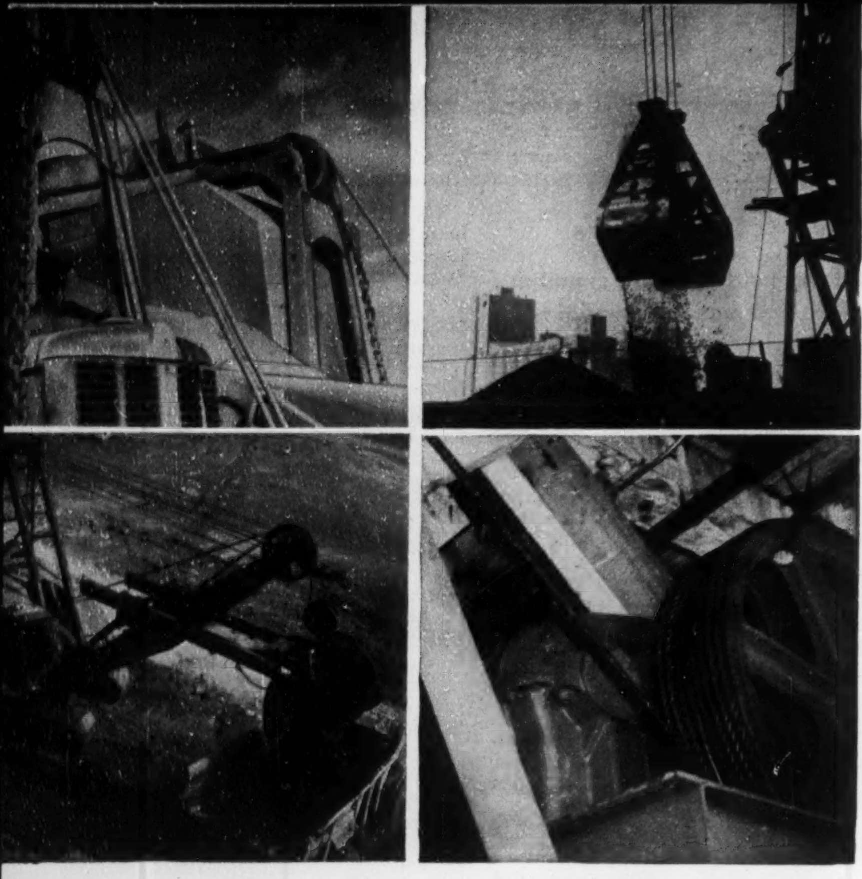
According to Siegel, work on the industrial city will start next sprnig.

Design revision ordered in sewage plant hassle

Seattle city engineer W. E. Parker has been instructed by the city council to revise plans for a proposed sewage disposal plant at Alki Point, taking into consideration recommendations made by John W. Cunningham, consulting engineer of Portland, Ore.

The consulting engineer was engaged by the city council to resolve a disagreement between itself and the city engineer. The council contended the plant should be confined to primary treatment until such treatment is proven inadequate, while Parker advocated a program of complete treatment without delay. Parker criticized the site purchased by the

(Continued on page 46)



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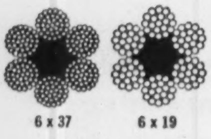

Look at a cross section of 6 x 37 wire rope. You see three rings of small, uniformly sized wires in each strand. This differs from a rope construction like 6 x 19, which contains fewer and larger wires.

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council on the advice of his predecessor; contended money spent on the type of plant favored by the council would be wasted if more complete treatment were found necessary.

Cunningham's report upheld the choice of the site. The consulting engineer advised that "it would provide a plant that will operate successfully under the plan proposed and, if necessary, can be extended by the addition of digestion facilities."

The report suggested that the specifications be changed to permit competitive bidding on the equipment of the plant and contended that rock excavation, estimated by Parker at $132,000, could be materially reduced.

Finally, Cunningham reported to the council that he believed nearly one-third of the cost could be saved by redesigning the plant.

Parker, in commenting on the consultant's report, noted that he had inherited the plans for the plant from his predecessor.

Replacement for burned wharf will have built-in controls

A new $1-million wharf scheduled for construction in Seattle, Wash., late this year by Standard Oil Co. of California will be designed especially to reduce the hazard of fire arising from ship collision, according to company spokesman, S. E. Stretton.

The new structure will replace one that was partially destroyed by fire last January, when the tanker J. L. Hanna rammed through its wooden bulkhead while attempting to tie up during a fast-running tide.

The company will completely rebuild its Point Wells oil-distributing plant, with the new wharf that will be located approximately 200 ft south of the old wharf location. The face of the new facility will be turned four degrees counter-clockwise to overcome tidal influences that often have made it difficult to warp big tankers into docking position.

The project will include a 50 x 1,050-ft pier with steel and concrete deck on wooden piling. On the wharf will be a barrel conveyor and a 40-ft x 120-ft warehouse to store products awaiting transshipment. Plans call for a central control of air-operated valves that within seconds can cut off the flow of any products to the wharf.

The plans also include an automatic shut-off of all electric power to the dock in event of a ship collision, thus eliminating the possibility of sheared electric lines contributing to the fire hazards.

(*Municipal continued on page 48*)

CAUTION
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CAUTION

C. L. Gleason, Chief Construction Engineer, Iowa State Highway Commission, designer; J. D. Armstrong Co., Ames, Iowa, builder.

Machine is run entirely by air—even pneumatically-propelled. Shoulder is first sloped to facilitate its operation.

Jaeger air power supplies the wallop

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Breaking 600 ft. of concrete curbing per hr., at a cost of only 10c a ft. compared to over 35c by other methods, was achieved by Hallet Construction Co. on the widening of 70,000 ft. of Highway 150 between Independence and Walker, Iowa. This low cost and high production was obtained by means of a specially-designed curb breaker powered by a Jaeger "Air Plus" compressor. The machine is run entirely by air — even pneumatically-propelled.

On any job where air is used, the 15% to 25% higher "new standard" ratings of Jaeger Air-Plus compressors insure the higher volume of air required to operate at full efficiency. And they produce the additional air at moderate temperatures, with notably low fuel consumption and, we believe, the lowest cost of upkeep. Ask your Jaeger distributor to show what he can save you on air and air tool operation — or send for Catalog.

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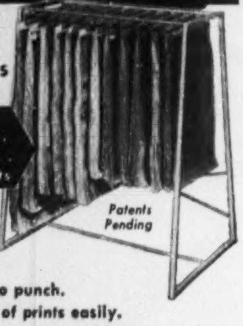

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MUNICIPAL

Philadelphia to get tough on slums

City prepares to enforce new housing code, enabling it to repair substandard dwellings and assess their owners

Although the new Philadelphia housing code won't go into effect until Jan. 1, Walter S. Pytko, city commissioner of licenses and inspections, is already rallying his executive staff for an all-out enforcement campaign.

Prepared by the Philadelphia Housing Association, this is the first rewriting for the ordinance since 1915. Pytko says he will need an additional 35 inspectors on his staff, and the Mayor has promised that he will get them to supplement his present staff of 64. The commissioner and his staff are responsible for regulation of 500,000 dwellings that break down into 345,206 single and two-family dwellings, 136,600 tenements and rooming houses, 2,653 apartment houses, 140 hotels and 38,698 combination commercial and dwelling structures.

At the start of the coming year, the augmented inspection staff will start a block by block check of the city's most blighted sections and those with the highest population.

Pytko states that his primary objective will be to attempt to aid in the rehabilitation of blighted areas. A secondary aim, he says, is to keep an eye on areas where the population density has increased sharply in order to catch any possible blight before it starts.

• **A brand new code**—The new code sets minimum standards of maintenance, facilities and supplies. Aimed primarily at tenant occupied, multiple-family buildings, it was drafted to eliminate substandard housing and to bring about improvements to housing showing signs of blight.

The code gives the city the right to repair a sub-standard dwelling and assess the owner for the cost. Under the new scheme of things, every dwelling unit must have an inside flush toilet, bathtub or shower and lavatory basin (two small units may share these facilities).

Each unit must have a kitchen, sink, hot and cold running water, water heating facilities, safe cooking equipment, sanitary refuse disposal facilities and safe and sound physical structure.

Multi-family dwellings must have a minimum of 150 sq ft of floor area for the first occupant of a dwelling unit, 100 for each of the next three occupants and 75 for each additional occupant.

For sleeping purposes there must be 75 sq ft for one person; for two or more persons of 12 years of age or over, a minimum of 50 sq ft per person. For children, aged one to 12, the sleeping minimum is 35 sq ft per person.

These requirements apply to all units that go to make up a multi-family dwelling.

The dwelling itself must have adequate lighting and ventilation of public stairs and hallways, fire extinguishing equipment, dual egress for upper stories, heat and common refuse disposal facilities.

Rooming houses must have one water closet, bathtub, shower and lavatory basin for each six occupants. Rooming units within the house must meet the dwelling-unit requirements except those applying to kitchen and sanitary facilities.

The new code sets up full enforcement and compliance procedures, including the right to condemn a property for use until code requirements are met.

The building code in general regulates the construction methods for all structures, including new dwellings and the alteration of older houses. The housing code, on the other hand, regulates the occupancy and maintenance of all structures used for living purposes.

The code was drawn up by a drafting committee and a general advisory committee appointed by the Philadelphia Housing Association. Jefferson B. Fordham, Dean of the Law School of the Univ. of Pennsylvania, served as chairman of both committees. The code drafting committee was composed of 15 citizens with special knowledge of housing. The committee met at two-week intervals for a period of six months.

The advisory body was made up of 97 persons who represented both private and public organizations with an interest in housing. Opposition developed to some phases of the code from the committee representing the real estate boards and the savings and loans council, from the Property Owners Association and from the Home Builders Association.

These interests were instrumental in having dropped from the approved code a minimum space requirement for one-family dwellings.

HOW TAYLORVILLE SOLVED ILLINOIS' **HARDEST** WATER PROBLEM

Since 1888, hardness of up to 974 ppm had wasted soap, left sticky curd on dishes and clothes, formed scale to clog pipes, *wreck* water heaters.

After World War II, geologists found one of the best well-field sites in central Illinois. Hardness was about 200 ppm, still far too high to satisfy taxpayers, far-sighted city officials.

So when well-field contracts were awarded, the project included a modern *water softening* plant. Consulting engineers recommended Permutit equipment.

Taylorville's Precipitator (shown at left) reduces hardness, turbidity and alkalinity in a single, quick step. Its efficiency greatly reduces filter loads, cuts backwashing to a minimum.

This Permutit installation reduces hardness to the specified range of only 60-80 ppm (a mere 4 grains) . . . a far cry from Taylorville's old 974 ppm level!

Permutit equipment can bring similar benefits to *your* city. Write today for information. The Permutit Company, Dept. ENR-9, 330 West 42nd St., New York 36, N. Y., or Permutit Company of Canada, Ltd., 6975 Jeanne Mance St., Montreal.

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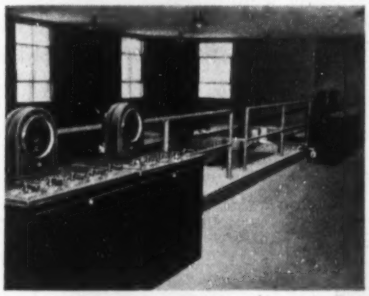

Taylorville's New Water Softening Plant
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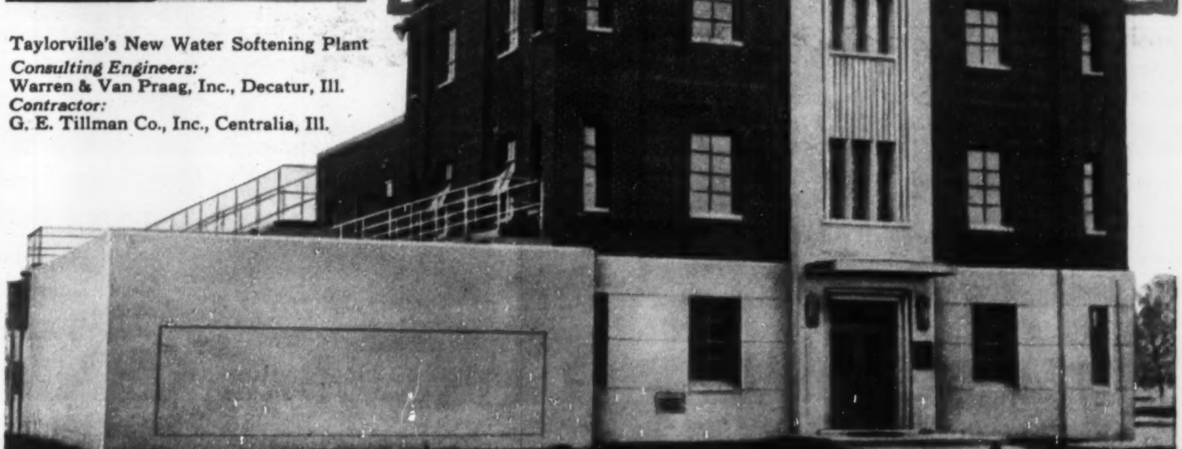
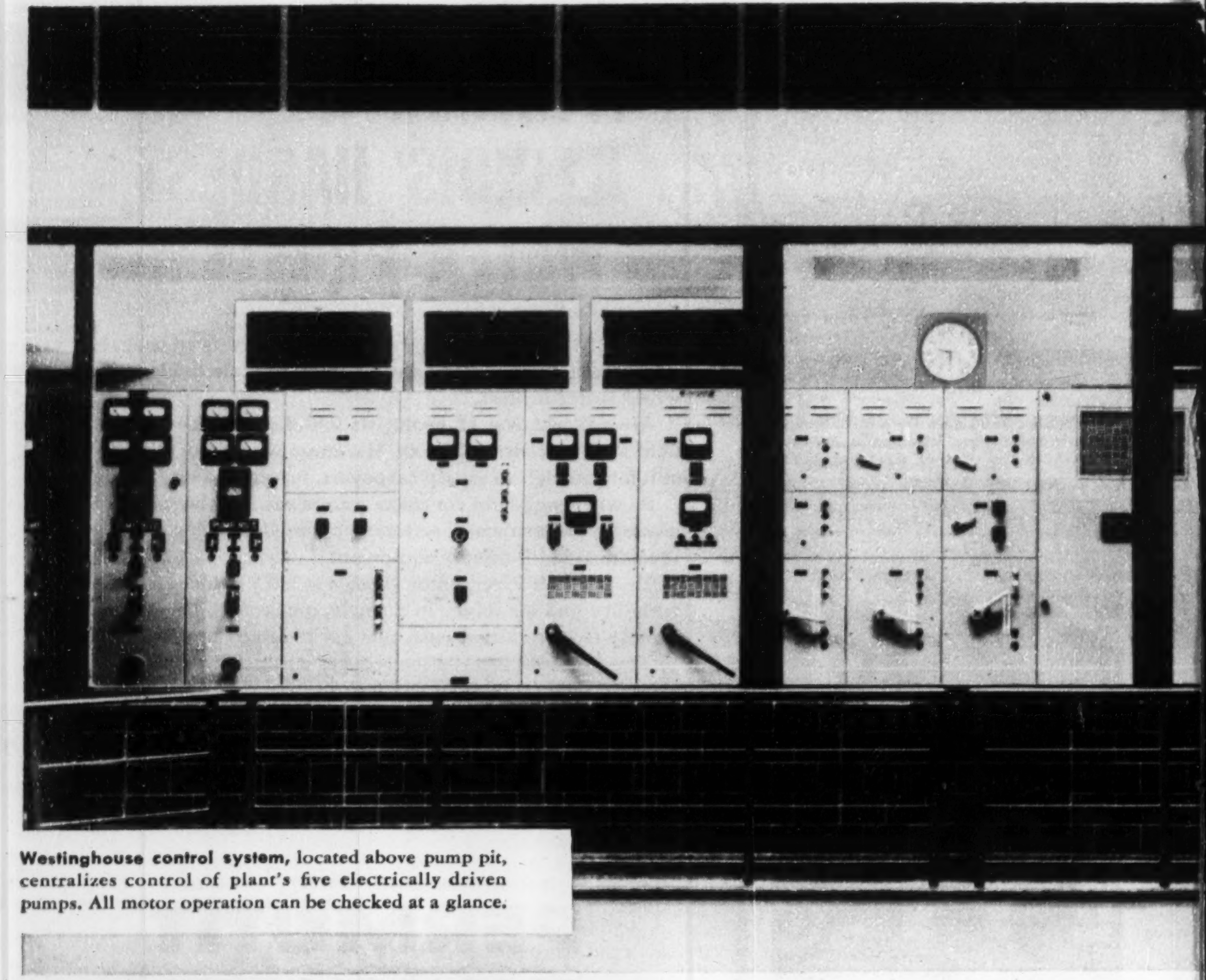
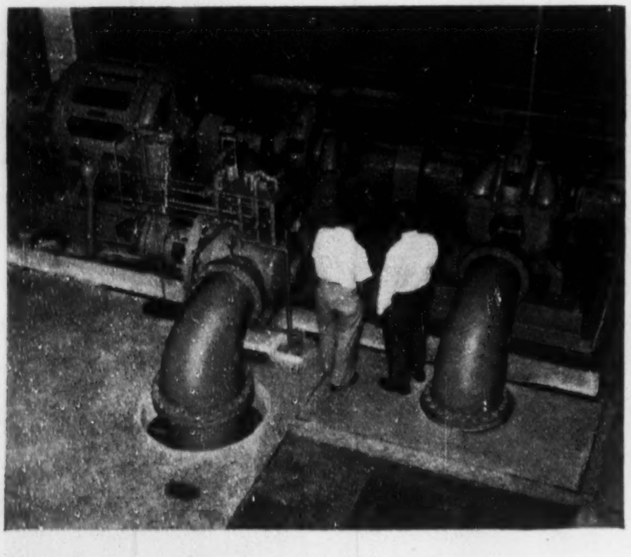
Contractor:
G. E. Tillman Co., Inc., Centralia, Ill.

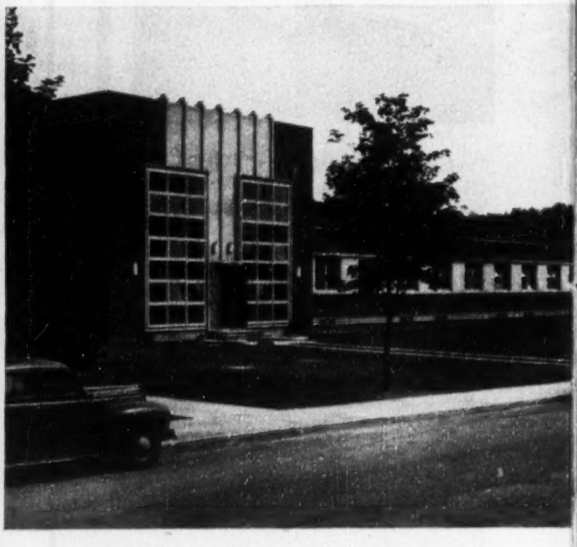




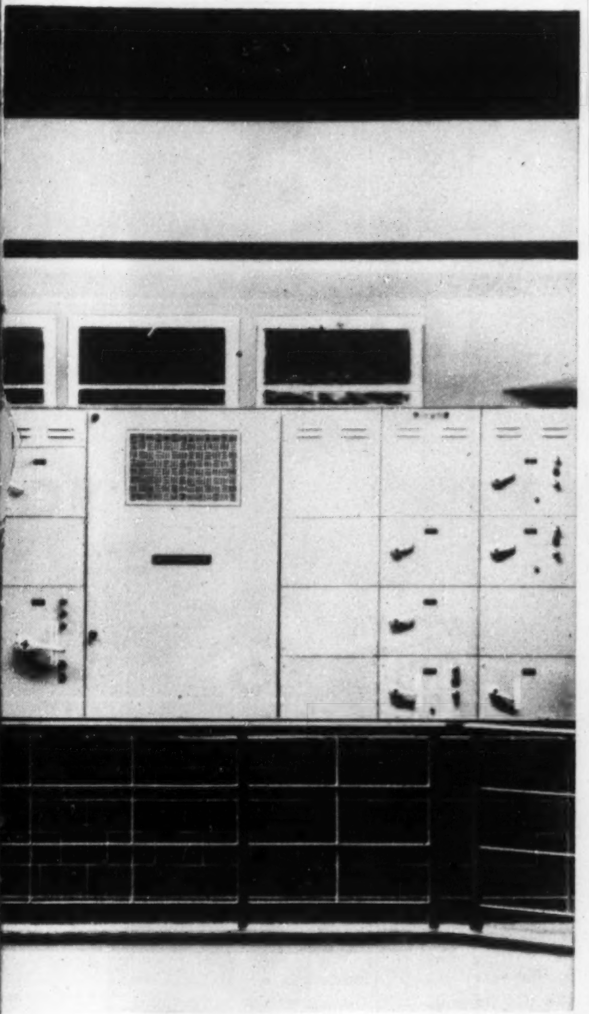
Westinghouse control system, located above pump pit, centralizes control of plant's five electrically driven pumps. All motor operation can be checked at a glance.



Westinghouse synchronous motor (2400 volts, 900 horsepower) operates one of the three 15-mgd electrically driven pumps at the three-million-dollar plant.



New 20-mgd filtration plant, Allentown, Pa. Consulting Engrs., Morris Knowles, Inc.; Electrical Contractor, Dravo Company—both of Pittsburgh, Pennsylvania.



Allentown's outstanding filter plant has a centralized pump control system

The new 20-mgd filtration plant at Allentown, Pa., has stimulated considerable interest throughout the waterworks field. This outstanding installation doubles the available water supply and is expected to meet the city's needs for the next 30 years.

From planning stages through installation of equipment, Westinghouse teams worked closely with the consulting engineers. They helped design the electrical system. They matched it with coordinated products that met the plant's rigid requirements for attractiveness, efficiency and simplified maintenance.

How well these were carried out is reflected in the Westinghouse pump control system. Its many switching and control units blend in height and appearance due to their modular construction. Efficiency is assured since the system centralized in one location operation of the plant's pumps. And maintenance is simplified. By being mounted in one line, all units are easily accessible from the front of the board.

This is another example of Westinghouse engineering and product services—ranging from electrical system planning help through design and application of equipment to meet any power problem . . . in any industry.

One call to your nearby Westinghouse Office brings this complete service to you, your engineers and contractors. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-94021

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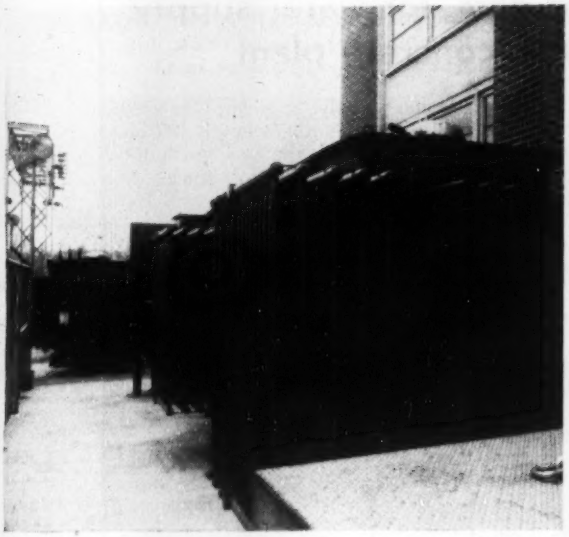
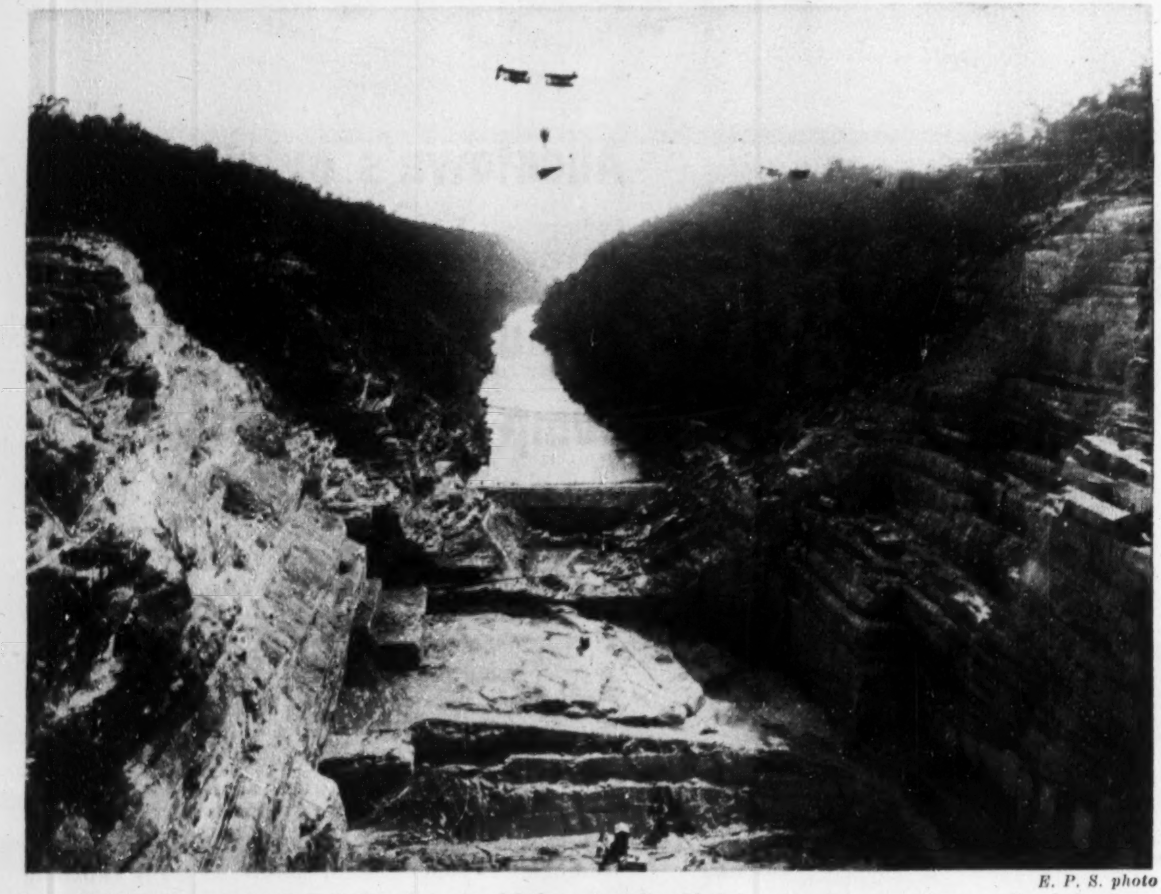


Westinghouse power transformers (12,000 to 2400 volts) furnish the filtration plant's entire power supply. Left background: part of Westinghouse outdoor substation.



E. P. S. photo

DAM SITE in Warragamba Gorge is 50 miles west of Sydney, Australia. Ideal for water storage, sandstone walls of the Gorge rise over 400 ft and run straight for almost 14 miles. The 50-ft weir at dam site was built in 1940 for emergency water supply.

E. P. S. photo

TELPHERWAY carries aggregate 12½ mi to dam from Nepean River gravel beds.

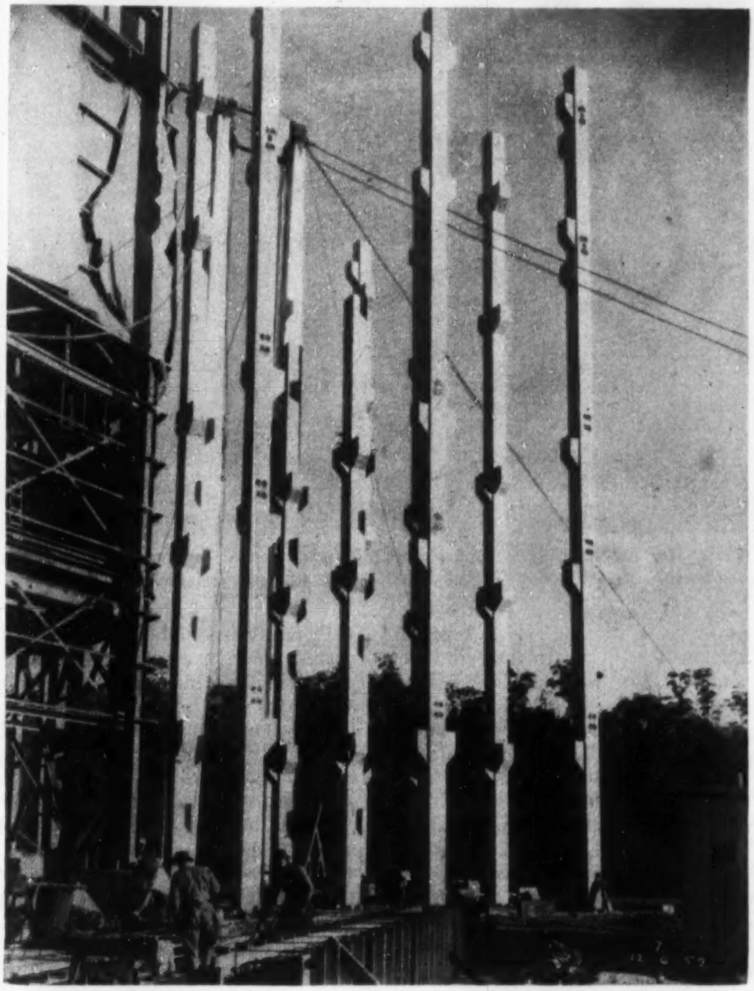
Australia's record dam, for water supply features an unusual concrete plant

To meet water supply needs of a rapidly increasing population, Sydney, Australia, is building what will be that country's highest dam–420 ft. Not only the dam stands out as an interesting project, but the whole plant for construction is unusual: a precast, prestressed, continuous-frame cooling tower for producing ice to cool the concrete aggregate and cold water to circulate through pipes in the dam until the concrete is thoroughly cured. A telpherway is used to transport aggregate overland from gravel beds 12½ mi from the dam site. And a big in-line conveyor separator system is used to stockpile aggregate for transfer to the telpher bucket carriers.

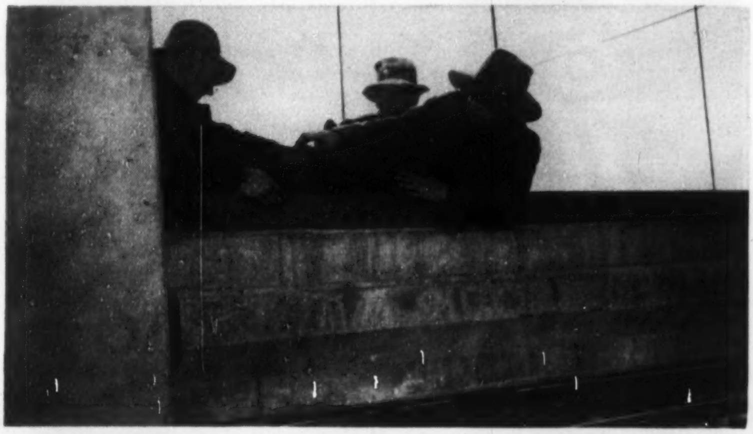
The 420-ft structure is located in the Warragamba Gorge, 50 mi west of Sydney in barren hill country. The gorge is almost an ideal location for a water supply reservoir: Its steep sandstone walls rise between 400 and 500 ft high forming a mammoth channel which runs almost straight for 14 mi. The dam, however, will back up a reservoir 35 mi long.

Preliminary work on the $53-million dam was started in 1946, when access roads had to be cut through the steep hills and extensive drilling was undertaken to find a suitable dam site. The project is actually an extension of an emergency scheme set up during the early stage of World War II to combat a severe water shortage brought on by an eight-year drought. In 1940 a 50-ft weir and an underground pumping station were erected to impound 1,780 acre-ft of water, and this weir now serves as cofferdam for the big structure.

(Continued on page 54)



COLUMNS for Warragamba cooling tower were precast and prestressed at site. Lugs support precast beams post-tensioned in place for continuous structure. Note holes in the columns for receiving cables and anchors of prestressed beams.



PRECAST beams were placed on column lugs and columns were jacked apart while joint was drypacked before post-tensioning. Since structure's completion no joints in the prestressed continuous frame show any signs of opening under load.

Another veteran SHONE speaks up!

WE NEVER WEAR OUT!

Back in 1891 a duplex unit of Shone* Pneumatic Ejectors was installed in the new Monadnock Block, then the world's largest office building. Come 1906 it was decided that this was a one-pump job, so one of the twins was unhitched, stored, and later returned to the factory for overhaul.

In 1911, weary of idleness, that same Shone was installed in the new Monroe Building nearing completion; and found itself alongside a new Yeomans vertical wet-pit centrifugal drainage pump.

1954 finds these two Yeomans units operating as efficiently as the day they were installed. "Ordinarily," says Chief Engineer John Kowalski, "we use the centrifugal, and test the Shone every week." It's a stand-by unit, fully able to handle the job should anything happen to the 43-year-old youngster. Neither unit has required any attention, other than normal maintenance, since Mr. Kowalski has been in charge.

Can't you hear that Shone saying "we never wear out!"

If you're interested in equipment that gives every indication of being indestructible, call your Yeomans representative. Keep in mind, too, that Yeomans recommendations are unbiased—Yeomans builds both centrifugals and ejectors: none better.

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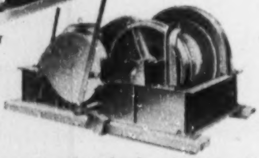

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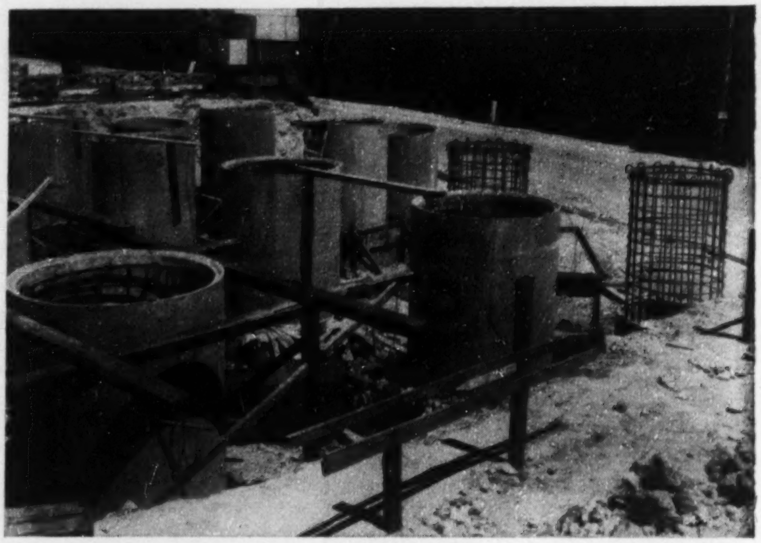
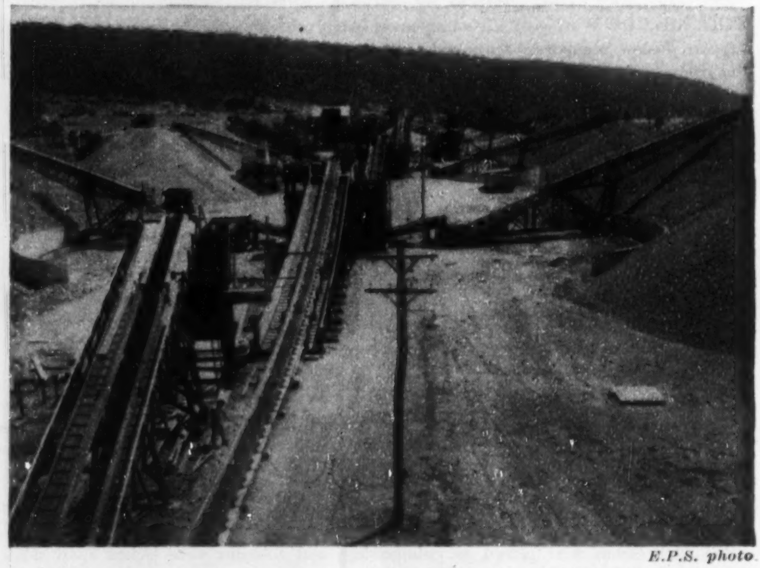


PIERS for cooling tower columns were formed of precast pipe set around circular reinforcing. Recess was left in concrete-filled pipe to receive columns ends.

To be a straight gravity type, the dam will be 1,100 ft along the crest and will have a 300-ft-wide spillway, and top drum gates 40 ft high. The reservoir will hold 1,410,000 acre-ft of water and will insure adequate supply for Sydney until 2000 A.D. Rainfall and runoff in these mountains are extremely variable, and a flood like one that occurred in 1952 would have filled the reservoir in five days had the dam been built then. But in time of drought it might have taken eight years to accumulate the same amount.

• **Aggregate by telpherway**—Since the nearest gravel beds were on the Nepean River 12½ mi from the dam site and with very hilly country in between, it was found most feasible to build a $1,125,000 telpherway to transport aggregate to the dam site. Economic construction of the dam calls for the delivery of 170 tons of aggregate per hour, and trucks or a small railway could not meet such a schedule in rugged country as cheaply as could the telpherway.

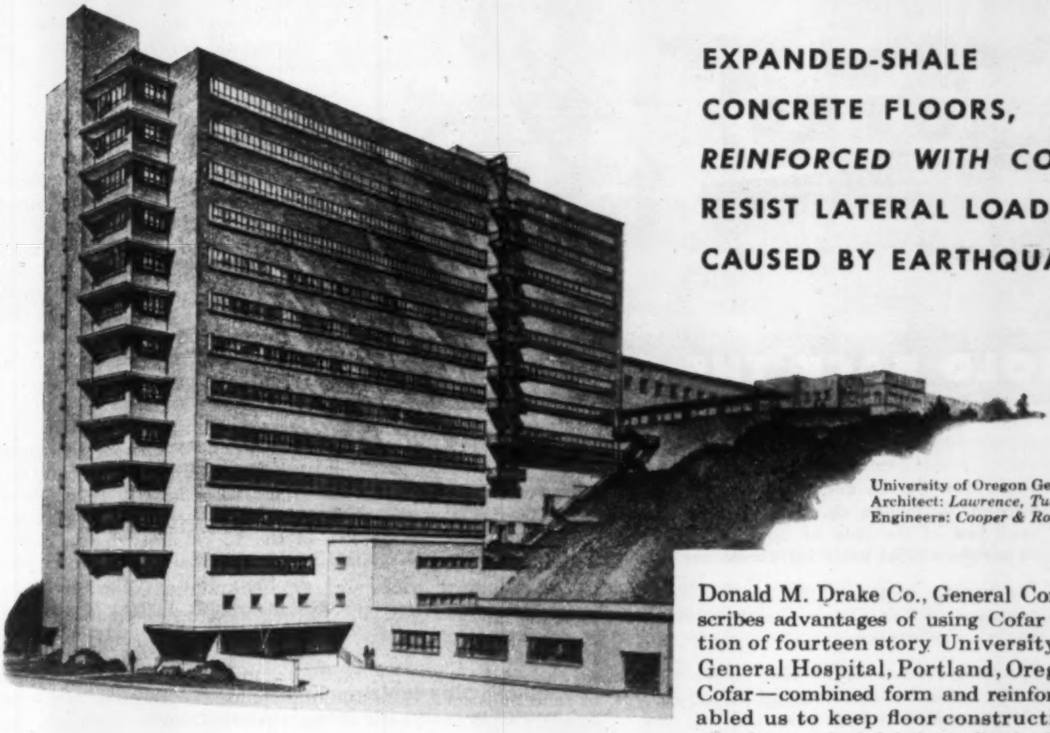
(*Continued on page 56*)



E.P.S. photo

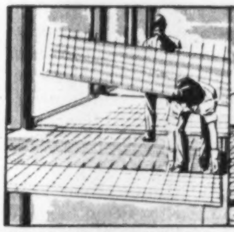
AGGREGATE SEPARATION PLANT at Nepean River gravel bed features straight-line conveyor separation, retaining walls to allow better cantilever of storage conveyors.

COFAR keeps pace with fast bolted frame construction in new Oregon Hospital

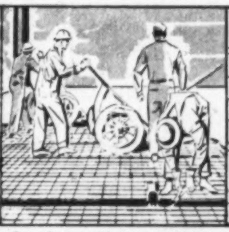


University of Oregon General Hospital
Architect: *Lawrence, Tucker & Wallman*
Engineers: *Cooper & Rose*

EXPANDED-SHALE CONCRETE FLOORS, *REINFORCED WITH COFAR,* RESIST LATERAL LOADS CAUSED BY EARTHQUAKES



Placing steel and form in one operation—Cofar steel units (with transverse temperature wires welded across corrugations) arrive at job site cut to length to fit building frame. When welded in place, they give frame added lateral strength.



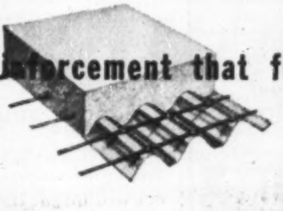
An immediate working platform—High-strength steel permits Cofar to absorb construction abuse. Corrugated sheets serve as tight form for wet concrete. After concrete sets, Cofar provides complete positive reinforcement at bottom of slab.

Safe, strong concrete floors—Fast Cofar construction speeds occupancy, is suited to steel or concrete frame construction. Cofar monolithic floors provide complete plate action for concentrated loads and horizontal forces. Cofar is fire safe.

Donald M. Drake Co., General Contractor, describes advantages of using Cofar in construction of fourteen story University of Oregon General Hospital, Portland, Oregon: "Using Cofar—combined form and reinforcement, enabled us to keep floor construction moving ahead 'on schedule' *immediately behind* rapid bolting of framework! By reducing over-all erection time, speeding-up the placement of concrete and insuring faster occupancy of the completed structure, Cofar provides economies in the floor system which benefit the owner, the architect and the contractor!"

Cofar deep corrugated steel units (with transverse temperature wires welded across the corrugations) serve as both form and reinforcement for concrete slabs, completely eliminating the expensive and time consuming construction of wood forms and provide all the positive steel needed in the structural concrete slab. For information, estimates or costs on *your* building project, contact home or district office, attention Dept. ER-E.

the reinforcement that forms



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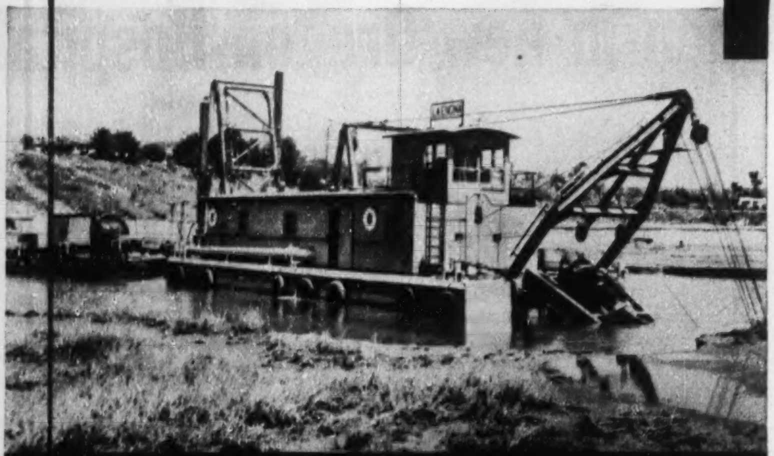

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The same dredge will be used for maintenance of the tidal basin, removing an estimated 50,000 cu. yds. of sand and silt accumulation each year.

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From a gravel bank on the Nepean River the rough aggregate is delivered to feed hoppers which then feed the material to a big in-line conveyor separator system, the larger screenings being stock-piled at the near end of the system and the fines ending up at the far end.

Conveyor belts in reclaiming tunnels carry aggregate to loading bins where vibratory feeders discharge it into measuring hoppers, which, in turn feed it to the waiting buckets on the telpherway. The 550 telpherway buckets have each a payload of 2,750 lb, travel at 6 mph. 274.5 ft apart, over the first three sections and at 4 mph 160.5 ft apart over the final sections which climb some 500 ft. Three power stations placed along the telpherway drive, the cable and six tension stations take up the slack.

• **Prestressed cooling tower**—The ice-making plant—used to cool aggregate and the concrete in place—is a continuous frame structure 101 ft tall and built of precast prestressed concrete. Ten of the 12 columns in the building are 76 ft long and were precast in their full length and then erected by cranes. Precast beams rest on lugs cast with the columns and are post-tensioned by the Freysinnet method (and grouted) with cables running continuous through two bays on one side and three bays on the other side of the building. Beams were placed on the lugs and then columns were jacked away while joints were dry-packed. Upon completion of the frame mortar joint settlements and deflections of the continuously prestressed frame were of the order assumed by the design engineers. No joint at the completion of post-tensioning had deflected more than 1/20 in. from its initial position. Since completion and loading with the cooling tower machinery, no joint has shown signs of opening.

Due to the continuity of the tower design, it does not lend itself to dismantling at the end of the job for re-erection somewhere else. But on completion of the Warragamba Dam the machinery will be removed and extensive tests will be made on the tower to provide data for subsequent designs.

The Warragamba Dam is being built by Sydney's Metropolitan Water Board.

Sealing a valley with ice

Australian engineers working on the Snowy Mountains hydro-electric project will install the biggest refrigerating

(*Continued on page 58*)

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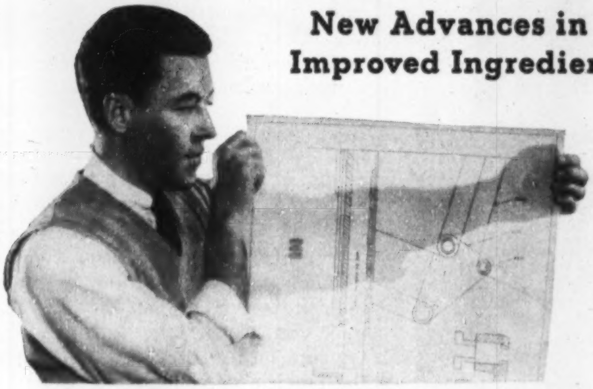

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A network of holes will be bored in the moraine, which is 500 ft deep and 900 ft wide. Tons of refrigerated brine will be dumped into these holes to freeze a solid wall beneath the surface. Once this is done it is hoped that additional brine will have to be pumped down only during the two summer months in the mountainous area.

Cities along Ottawa River take up pollution problem

A conference in Ottawa attended by representatives of Ottawa River municipalities appears to have set the stage for establishment of a joint Ontario-Quebec commission to tackle the problem of pollution.

If such a commission is set up, action will be initiated by the two provinces, most likely in association with the major municipalities involved. One of the first steps to be undertaken is a complete survey of the situation.

Presiding jointly over the conference were Dr. A. E. Berry, director of the Sanitary Engineering Division of the Ontario Department of Health, and Dr. T. J. Lafreniere, who holds the same position in Quebec's Department of Health. Both agree that joint action by the two provinces is necessary and that public appreciation of the urgency of the problem must be broadened. According to Dr. Berry there is no question but that many sections of the Ottawa River are seriously polluted. "The remedy is bound to be costly," he stated, "but I do not believe that the public will reject the expenditure when the urgency of the problem is fully realized."

Two of the principal cities involved—Hull (in Quebec) and Ottawa—both discharge untreated sewage into the river above its junction with the St. Lawrence at Montreal. Although there are rapids in the 100 miles downstream, there are no real falls. And the many municipalities on the river banks' as well as two large pulp and paper mills, contribute to the pollution.

Ottawa already has been ordered to take action on discharge of its sewage, but civic authorities feel that they

(*Continued on page 60*)

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Get right into the cab of a MICHIGAN* excavator-crane, stand behind the operator—and get an eye-full of the *right way to get more yardage.*

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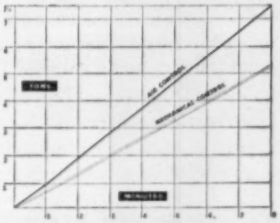

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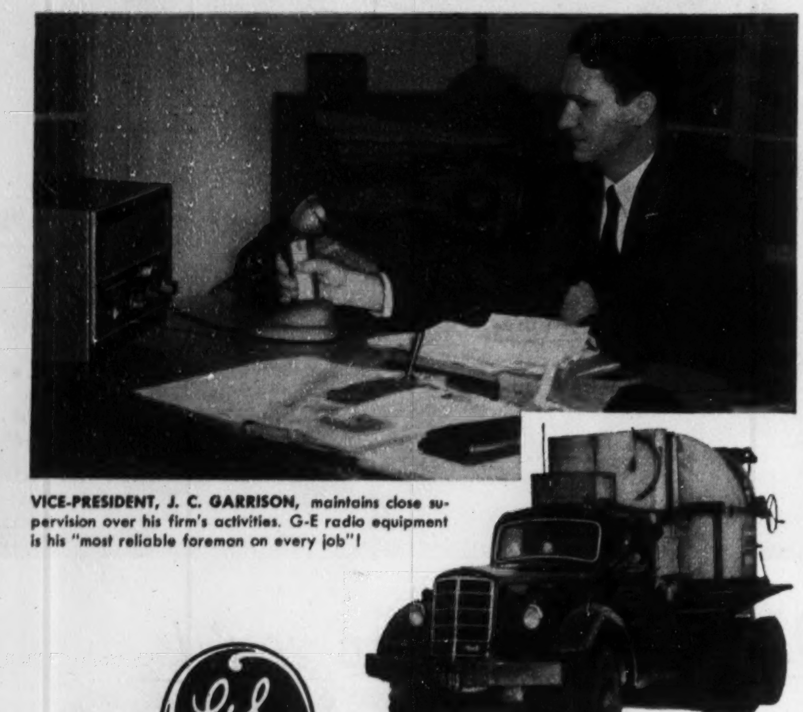

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should not be forced to undertake a large expenditure unless all the other river municipalities also safeguard the discharge of effluents.

International briefs . . .

- **Underground power plant**—The Philippines have hired a Swedish engineering firm (Widmark & Platzer) to build a $5.7-million underground power station near the city of Baguio on Luzon Island. The facility, which will have a capacity of 75,000 kw, will take 18 months to complete.

- **Multi-million causeway**—Point Four technicians are making a port improvement survey for Honduras at the Pacific ports of Amapala and San Lorenzo. The project would involve construction of a multi-million dollar causeway between the two ports. At present, ship cargo is unloaded at Amapala, put into lighters and towed on a 3½-hour trip to San Lorenzo.

- **Pulp mill development**—Plans for a $30-million pulp mill development in Alberta have been announced jointly by St. Regis Paper Co. and North Western Pulp Power Co. (a subsidiary of North Canadian Oils). Final plans, involving 4,000 sq mi of woodland 120 mi west of Edmonton, will be drawn up in the next few months.

- **U. S. aid to Arabs**—Five development schemes in Jordan will be financed by U. S. economic aid amounting to $8 million. Money will go toward improving irrigation ($3 million), roads and communications, pastures ($2 million), forests ($500,000)—and exploitation of subterranean waters.

- **Boosting Bengal economy**—Pakistan will spend $43 million this year to raise living standards in East Bengal province. Most of the money will be used to finance important development projects and provide food supplies. Over half—$24.6 million—will go toward current schemes for hydro-electric, road-building and agricultural works.

- **Goal: cheaper power**—Honduras has asked the International Bank for Reconstruction and Development for financial and technical aid in connection with construction of a $3-million hydro-electric project on the Rio Lindo below Lake Yojoa. The country's electric power now is produced by diesel units. Household light rates in the capital city of Tegucigalpa are 20 cents per kwh, reportedly the highest in Central America.

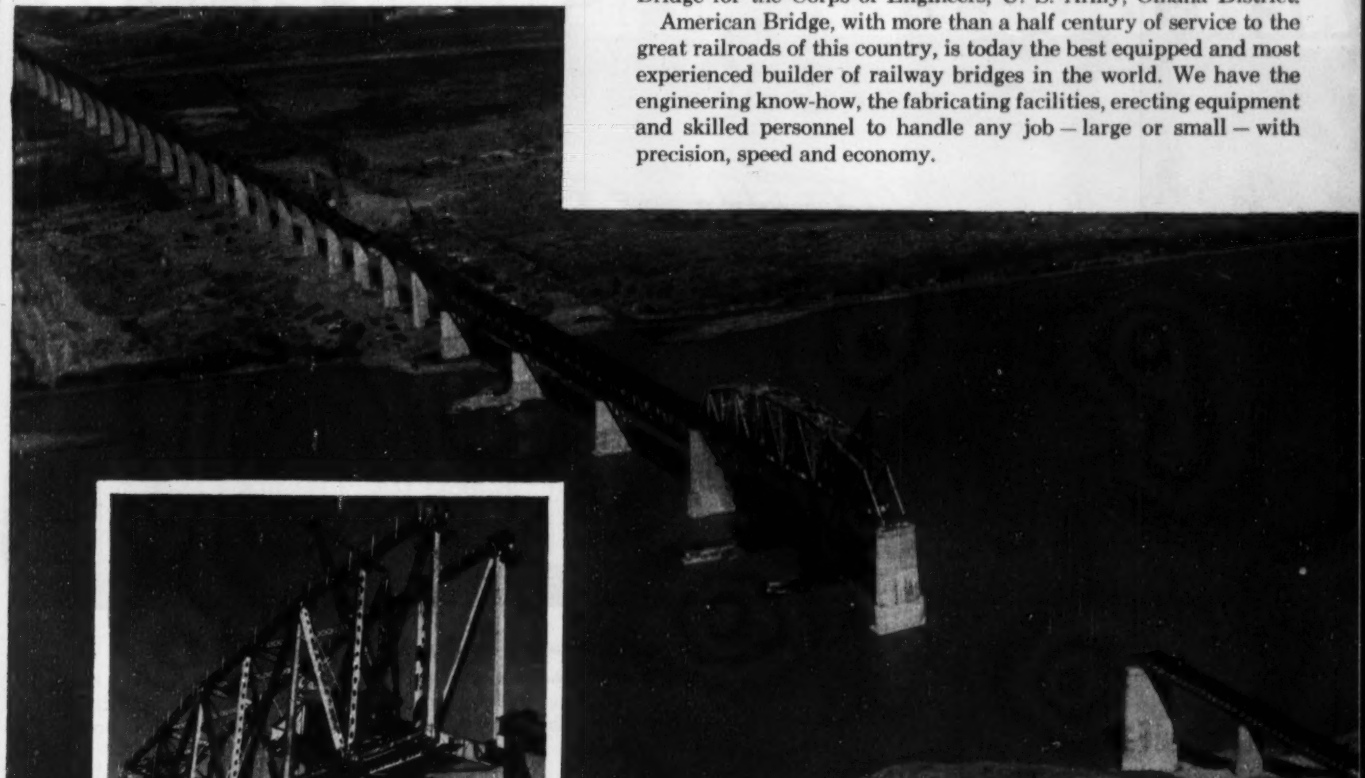
American Bridge builds 4,890-ft. bridge on CHICAGO MILWAUKEE ST. PAUL AND PACIFIC relocation project

New bridge over Missouri River has two 372-ft. through-truss spans.

THIS single track bridge over the Missouri River near Chamberlain, South Dakota, is part of the relocation of the C.M. St. P.&P. tracks made necessary by the construction of the Fort Randall Dam and Reservoir. It replaces the old bridge about 9,000-ft. upstream.

The 4,890-ft. structure features two 372-ft. through-truss spans over the main channel which provide a 42-ft. clearance above normal pool. The long bridge also has three 240′ deck truss spans, twenty-five 120′ deck plate girder spans, and four 98′ deck plate girder spans. Approximately 6,200 tons of structural steel went into the bridge, all of which was fabricated and erected by American Bridge for the Corps of Engineers, U. S. Army, Omaha District.

American Bridge, with more than a half century of service to the great railroads of this country, is today the best equipped and most experienced builder of railway bridges in the world. We have the engineering know-how, the fabricating facilities, erecting equipment and skilled personnel to handle any job—large or small—with precision, speed and economy.



Plans and specifications by Corps of Engineers, U. S. Army.
Fabricated and Erected by American Bridge.
Work performed under the direction of W. G. Powrie, Chief Engineer, C. M. St. P. & P. Railroad.

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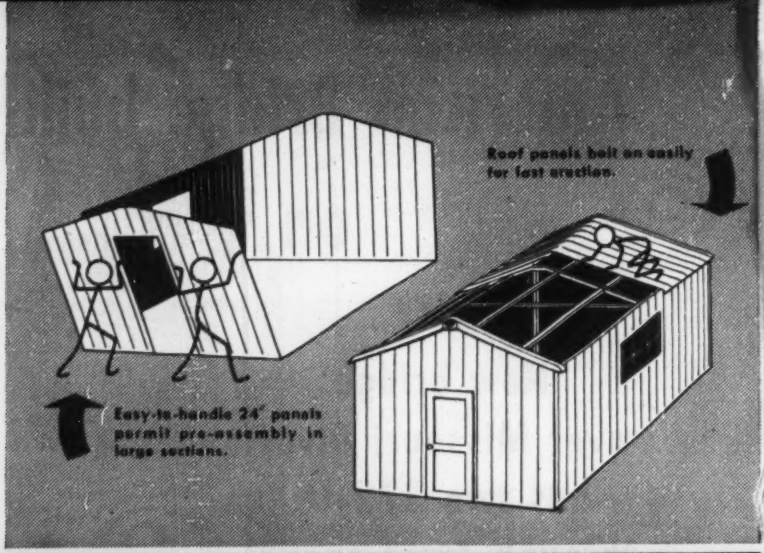
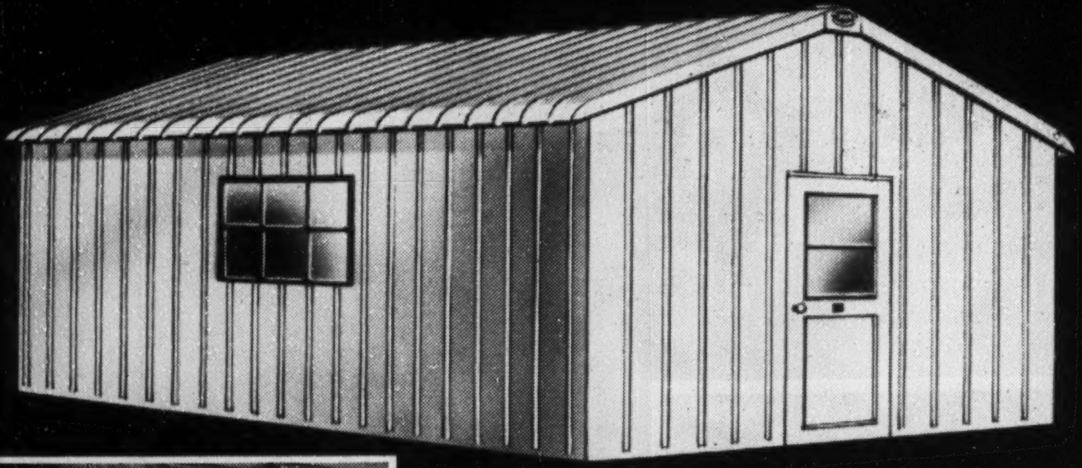
UNITED STATES STEEL

NOW 2 men put it up with a wrench ...in hours


Roof panels bolt on easily for fast erection.
Easy-to-handle 24" panels permit pre-assembly in large sections.

NEW BUTLER Panl-Frame Building



New steel framework with all-bolted construction gives you fast assembly, plus long life.

For prompt reply, address office nearest you:
BUTLER MANUFACTURING COMPANY,
7418 East 13th Street, Kansas City 26, Missouri
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Please send me name of my nearest Butler dealer—also your free folder on new Butler Panl-Frame steel buildings.

Name________________________________

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Address_____________________________

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Here's a new steel utility building that's a budget planner's dream!

With Butler panelized construction, wall panels can be quickly and easily pre-assembled into large sections and tilted into place on any type foundation. A wrench and screw driver are the only tools needed. Unskilled workers can easily do the job.

Roof panels go up just as easily by simply bolting them to steel frame and eave channels. In hours, instead of days . . . and at minimum erection cost . . . a Butler Panl-Frame building is up and ready for use.

And the uses are unlimited—for field houses, bulk plants, supply depots, pump houses, electric power stations, garages . . . for every utility need. Sizes from 6′ to 24′ widths . . . 8′ or 10′ high sidewalls . . . in any lengths desired by adding extra sections.

In new Butler Panl-Frame buildings, you get built-in quality and construction features that have made Butler steel buildings best sellers the world over. Carefully engineered framework gives you maximum strength per pound of steel. Butler galvanized, high-rib panels add extra strength . . . provide permanent, weather-tight, fire-safe shelter.

Compare Butler Panl-Frame building prices and erection costs with those of conventional buildings. Learn how you can stretch your building budget. See your Butler dealer or write for free folder.

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MEN AND JOBS

Howe, Canadian engineer, gets SAE aviation award

Clarence D. Howe, Canadian civil engineer and statesman, will be this year's recipient of the prized Daniel Guggenheim Medal on Oct. 8, a three-society announcement said this week.

The award will be presented at Los Angeles, at a session of the National Aeronautic meeting of the Society of Automotive Engineers. SAE sponsors the Guggenheim award jointly with the American Society of Mechanical Engineers and the Institute of the Aeronautical Sciences.

The Canadian official–who is a native of Waltham, Mass., and an M.I.T. graduate in civil engineering–is honored for "initiating and organizing commercial air routes and services, promoting aeronautical research, development and production of aircraft and engines, and advancing the art of aeronautics."

At present Canadian Minister of Trade and Commerce, Mr. Howe has served in the Canadian cabinet ever since 1935 in various capacities, and is credited with organizing the ground and operating services of Canada's first transcontinental air route and founding the government - owned Trans-Canada Air Lines. His cabinet post now makes him also chairman of the Privy Council on Scientific and Industrial Research.

During World War II he served as Minister of Munitions and Supply, and later as Minister of Reconstruction. Mr. Howe also is a holder of the Herbert Hoover Medal–awarded jointly by four U. S. engineering societies.

Planner named to staff of HHFA slum group

Tracy B. Augur–who had a major hand in the planning of Oak Ridge, Tenn., and several of the U. S. "Greenbelt" towns–has been named Assistant Director for Urban Planning Assistance in the Housing and Home Finance Agency's Division of Slum Clearance and Urban Redevelopment.

Augur will assist J. W. Follin, division director, in carrying out a program of urban planning assistance provided under Section 701 of the Housing Act of 1954–under which HHFA may grant funds to state planning agencies to assist cities of under 25,000 population with preparation of city plans.

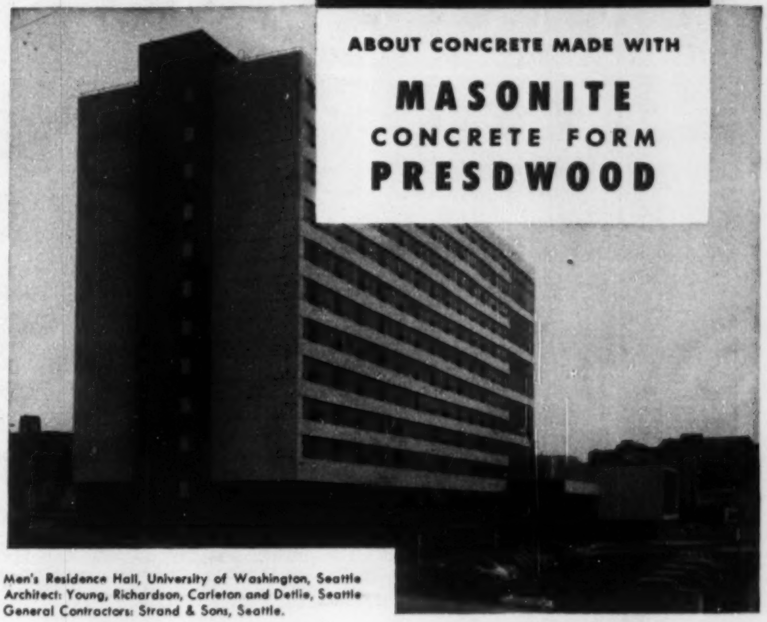
(*Continued on page 64*)

"Smoothest Surface ever"

—SAYS RAY W. STRAND
of Strand & Sons

ABOUT CONCRETE MADE WITH

MASONITE
CONCRETE FORM
PRESDWOOD



Men's Residence Hall, University of Washington, Seattle
Architect: Young, Richardson, Carleton and Detlie, Seattle
General Contractors: Strand & Sons, Seattle.

"Concrete Form Presdwood gives us the smoothest surface we have ever been able to produce."

Mr. Strand further states that the extreme surface smoothness also saves money by reducing costs of sacking and grinding. He used these all-wood hardboard panels eight times on this job and felt they were good for the four more times needed to finish the structure.

Concrete Form Presdwood® can smooth the way for you—in hours and dollars. Send today for our free booklet. It has the facts!

PUT THESE ADVANTAGES TO WORK FOR YOU!

- Two labor-saving sides to choose from: (a) smooth side for painted surfaces, (b) screen side for concrete of uniform color.
- Low first cost—less than ½ that of other smooth-surface methods.
- Can be curved for arches, columns, etc.
- Uniform and complete hydration assured.
- Large 4' x 8' and 4' x 12' panels handle easily, create fewer fins.

Save Two Ways with Masonite Presdply!

Try Presdply on your next job and get both these money-saving advantages: (1) No backing needed, for Presdply has the structural strength of plywood and the smooth, texture-free surface of Presdwood. (2) Smooth concrete will need minimum rubbing, will quickly be ready for painting. Send for your free sample.

PRESDWOOD
WOOD MADE BETTER

NATURALLY STRONGER WITH LIGNIN
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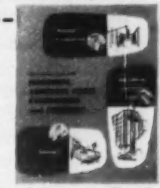
Chicago 90, Ill.



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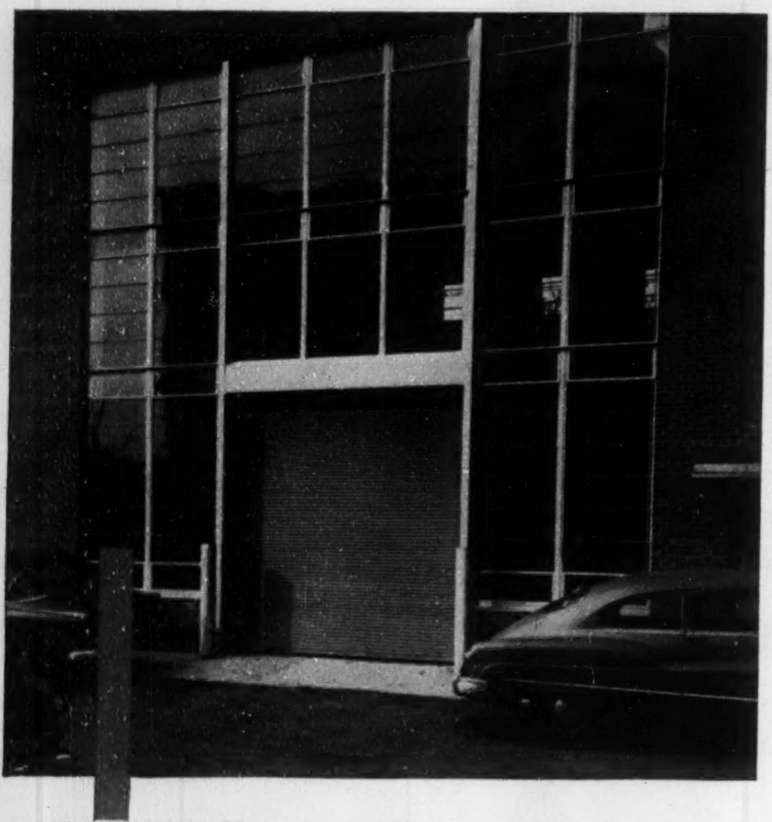

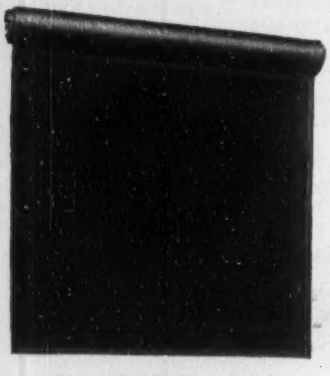

"Glass Wall" Installation Dramatizes Advantages of Kinnear Rolling Doors

Heavily Galvanized Doubly Protected

Kinnear Steel Rolling Doors are heavily galvanized (1.25 oz. of zinc per sq. foot, as per ASTM standards) to provide a lasting weather resistance. In addition Kinnear Paint Bond, a special phosphate application, provides for easy, thorough paint coverage and lasting paint adhesion.

Light from a huge "glass wall" floods into the new engineering building at Howard University, Washington, D.C., shown above.

The Kinnear Rolling Door centered in this glass wall can be operated or left open without blocking off a single inch of glass area.

The rugged curtain of interlocking steel slats — originated by Kinnear — coils compactly above the opening. All surrounding floor, wall and ceiling space remains clear and usable *all the time.*

Notice also how the straight lines of the Kinnear curtain add to the modern appeal of this building.

In addition to this space-saving "self-contained action", Kinnear Steel Rolling Doors offer durable, low cost, all-metal protection against intruders, vandals, wind, weather, and fire.

Kinnear Rolling Doors are built in any size, with manual or motor operation. Write for full details.

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SAVING WAYS in DOORWAYS
KINNEAR
ROLLING DOORS

A native of Brooklyn, N. Y., Augur is a graduate of Cornell University, and took a master's degree in city planning at Harvard. He has served in planning capacities with the Tennessee Valley Authority, the former Resettlement Administration, and as a consultant to the city of Cincinnati. Since 1949, he has been with the Federal Works Agency.

Appoint New York City man as Seaway resident chief

William H. Latham—who for more than 30 years has been in charge of large-scale design and construction for New York City and state engineering organizations—has been appointed resident engineer in charge of construction for the St. Lawrence Power project.

Mr. Latham will headquarter at a new field office planned by the New York State Power Authority in the area of Massena, N. Y., to be opened in mid-September.

A Massachusetts Institute of Technology graduate, Mr. Latham joined the Long Island State Park Commission soon after graduation, leaving that organization, in 1936, to join the city's department of parks. He has been chief engineer in charge of operations and maintenance for that department.

GSA supervising architect retires after 20 years

Allen S. Thorn, supervising architect for the Public Building Service of the General Services Administration, retired August 31. He had served with PBS and its predecessor, Public Buildings Administration, for nearly 20 years; had been Supervising Architect since 1949.

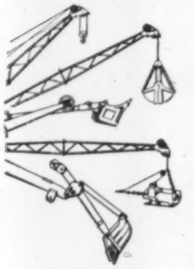
A native of Newark, N. J., Mr. Thorn began his architectural training in 1910 in the offices of several architects of that day, and he was registered as an architect in his own right (in New York and New Jersey) in 1914.

In 1925, he joined the architectural firm of Simon & Simon in Philadelphia, and a year later, he joined Zantsinger, Borie and Medary of Philadelphia, taking part in such projects as the Bok Tower, dormitories for the university of Chicago, and many large hospitals. In 1931-34 he was coordinator between his office and the Office of the Supervising Architect on the construction of the Department of Justice building in Washington. He joined the government service in 1935.

(*Men and Jobs continued on page 69*)

(*Advertisement*)

Consider Future Needs When Buying An Excavator



The machine a contractor buys today as a shovel, he might need as a crane tomorrow . . . or as a dragline, clamshell, or hoe. Because the contractor knows that under today's narrow margin conditions, it takes specialized equipment to handle profitably the job at hand. Because of these changing needs and because equipment investment must be kept to a minimum, it is wise in buying an excavator to get one that is truly and easily convertible in the full sense of the word, not just one on which different booms can be hung.

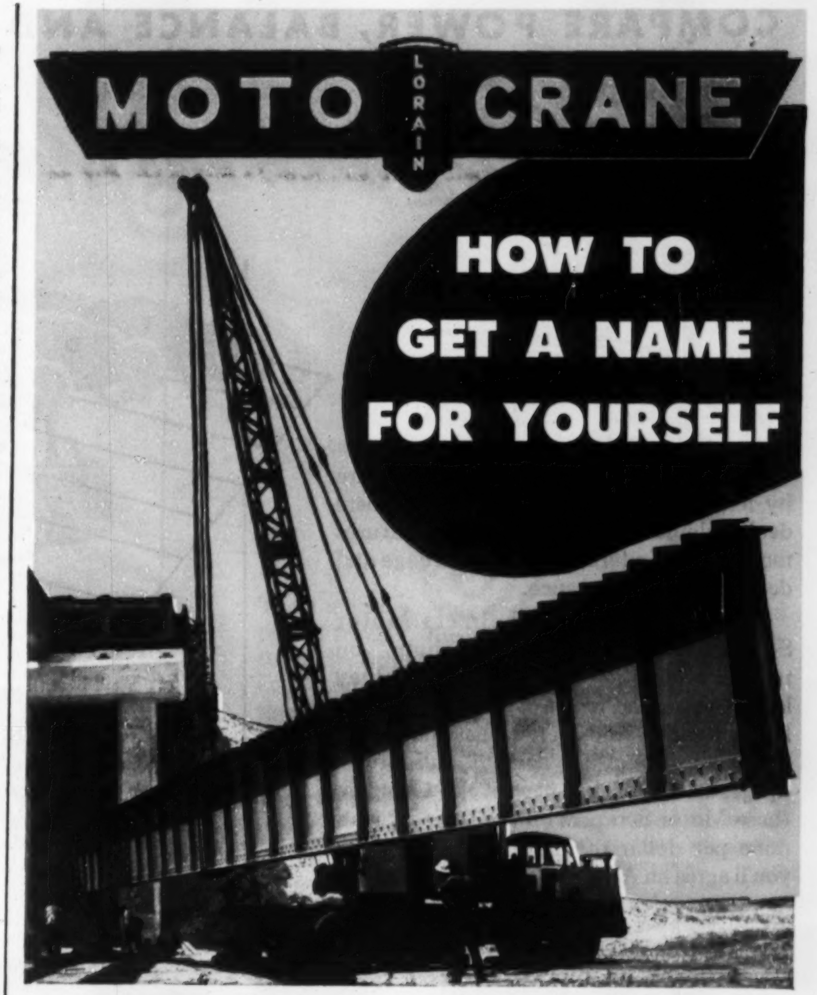
For example, a machine might be entirely acceptable as a shovel or originally built, but one day it is changed over to a crane by simply putting on a crane boom. That makes it *look* like a crane, anyway. But as a crane, it might have little stability over the sides, thereby severely reducing its lifting capacity for full circle operation, no precision boom lowering device for careful, precise boom control on steel erection, no power load lowering for inching down heavy loads. Possibly drum sizes cannot be changed with convenient lagging to vary line speeds and cable winding as needed. There may be no gantry for easy derricking of long booms, no boom harness and pendants to reduce reeving time when changing boom lengths. In other words, it isn't a crane that can be used as an efficient, money-making tool. It still is just a shovel with a crane boom hung on it.

Maybe the next job calls for a dragline. Well, hang on a dragline bucket and you're in business—or are you? What about a fairlead properly designed to work smoothly and efficiently to provide minimum drag-in cable friction and wear—and a "convertible" dragline boom head to provide large, centralized diameter sheave for longer cable life and to prevent off-center loads on the boom. How about lagging in diameter to put more pull on the drag-in; and more speed on the "hoist." And how about "nosing-in" of the crawler. The proper length crawler can make or break a dragline job.

And so it goes for all the front ends. Each is designed to do a different job. And when used for those jobs most profitably, they should incorporate the features needed for the specific job at hand.

A truly convertible machine can be a wonderful investment for a contractor—can fit any job the contractor might do—today, next month or 10 years from now.

New business opportunities don't pass by the contractor who is prepared now to take advantage of any job that comes along—who has lower costs because of lower equipment investment—and who, when he gets on the job, has the proper equipment to fill the need—at the highest profit to him.



The above name plate, which in itself, costs only pennies, is the most valuable thing you can buy on a rubber-tire crane . . . and it's a name that can build up *your* name among your customers for reliable, satisfactory results. It identifies a Lorain Moto-Crane*—made by the company that, in 1918, originated the truck crane idea. It represents the most number of years of experience in building rubber-tire carriers to withstand the "live loads" created by shovel-crane use. It represents the greatest selection available in rubber-tire excavators in 7 different capacities from 6 to 45 tons, plus many choices in drives, engines and front ends. It represents the continual advancements in design that make the Moto-Crane* still the last word in rubber-tire cranes. You need never "take a chance" when buying this type of equipment, because the name "Moto-Crane*" on a rubber-tire crane is your assurance of a "profit-maker" whatever your needs. Regardless of the capacity for your job or the price you want to pay, check with your Thew Lorain Distributor on the Moto-Crane.*

THE THEW SHOVEL CO., LORAIN, OHIO

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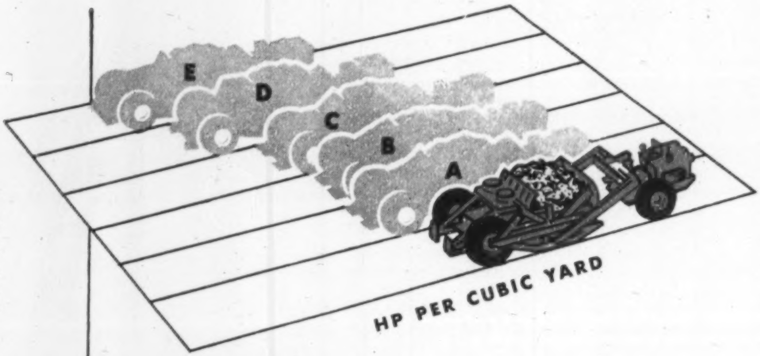
REMEMBER—IT ISN'T A MOTO-CRANE* UNLESS IT'S BUILT BY . . .

THEW LORAIN.

COMPARE POWER, BALANCE AND TRACTION AND

Why Allis-Chalmers Motor Scrapers



Examine the Allis-Chalmers TS-200 or TS-300 Motor Scraper point by point, feature by feature. Then let your Allis-Chalmers dealer demonstrate what these features mean to you in terms of bonus yardage and dependable performance.

See how fast Allis-Chalmers Motor Scrapers accelerate to "get the jump" on normal production from the moment they leave the pusher. See how safely they highball with a full load . . . how fast and steady they pull through the deep fill and return, up grade, to start a new cycle. Compare these Motor Scrapers on the basis of work done per dollar of investment. We think you'll agree an Allis-Chalmers Motor Scraper is your *number one* earth-moving value.

ACCELERATES FAST

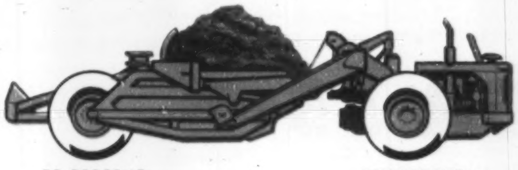
The TS-200 develops 17.6 hp per cu yd struck capacity . . . the TS-300 develops 20 — the highest ratios in their respective classes. With more power to move the payload, these machines get away from the pusher *fast* and maintain high average speeds throughout the entire cycle.

PERFORMANCE MAKES DOLLARS WHEN DESIGN

YOU'LL SEE

Out-produce

WEIGHT DISTRIBUTION LOADED

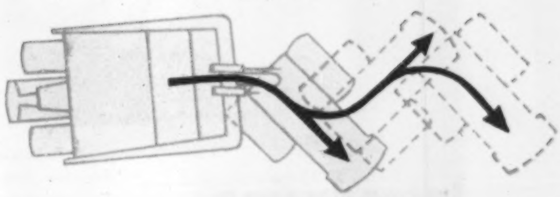


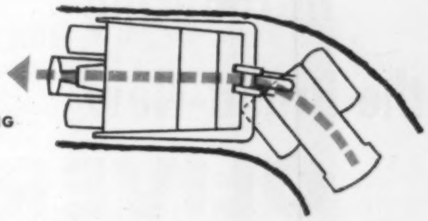
50 PERCENT 50 PERCENT

HIGHBALLS WITH THE PAYLOAD SAFELY

Loaded, the Allis-Chalmers Motor Scraper has equal weight on all four tires. This ideal weight distribution, together with low center of gravity, direct hydraulic steering which eliminates jackknifing, and big air brakes on all four wheels, allows the Allis-Chalmers Motor Scraper to take advantage of its high hp ratios by maintaining fast, yet safe haul speeds.

DUCK-WALKING





BACKING

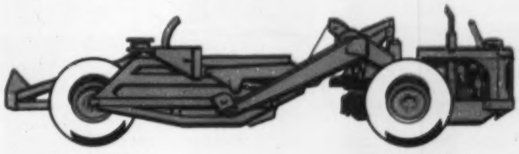
MANEUVERS EASILY

There are no steering brakes to rob you of tractive power. Instead, direct hydraulic rams turn the tractor in the desired direction of travel. Steering is sure and positive—even going down extremely steep slopes in loose footing.

By swinging tractor left and right with the steering rams, the Allis-Chalmers Motor Scraper can duck-walk through heavy going where others bog down.

Backing up in close quarters is simple. Two-wheel tractor has complete control over scraper body . . . can even change directions without forward or backward movement.

WEIGHT DISTRIBUTION EMPTY



34 PERCENT 66 PERCENT

COMPLETES THE ROUND TRIP QUICKLY

The return trip from the fill is usually uphill. That's where two-wheel design pays off. When empty, 66 percent of the Motor Scraper's weight is carried on the traction wheels. There are no front wheels to rob drive wheels of tractive weight or to create rolling resistance in heavy going. This enables the Motor Scraper to make the round trip faster and usually in higher gear than other units.

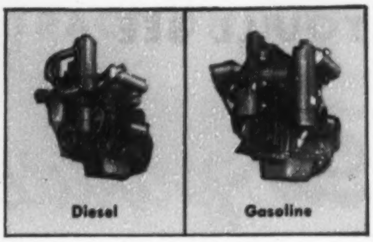
MAKES SENSE

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Takes all equipment—
front— rear— or side-mounted!

The built-in hydraulic 3-point hitch on the Super 55 operates a wide choice of Oliver and other simple, low-cost tools. Its husky, one-piece frame makes a convenient, solid foundation for front- or side-mounted equipment.



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Most powerful
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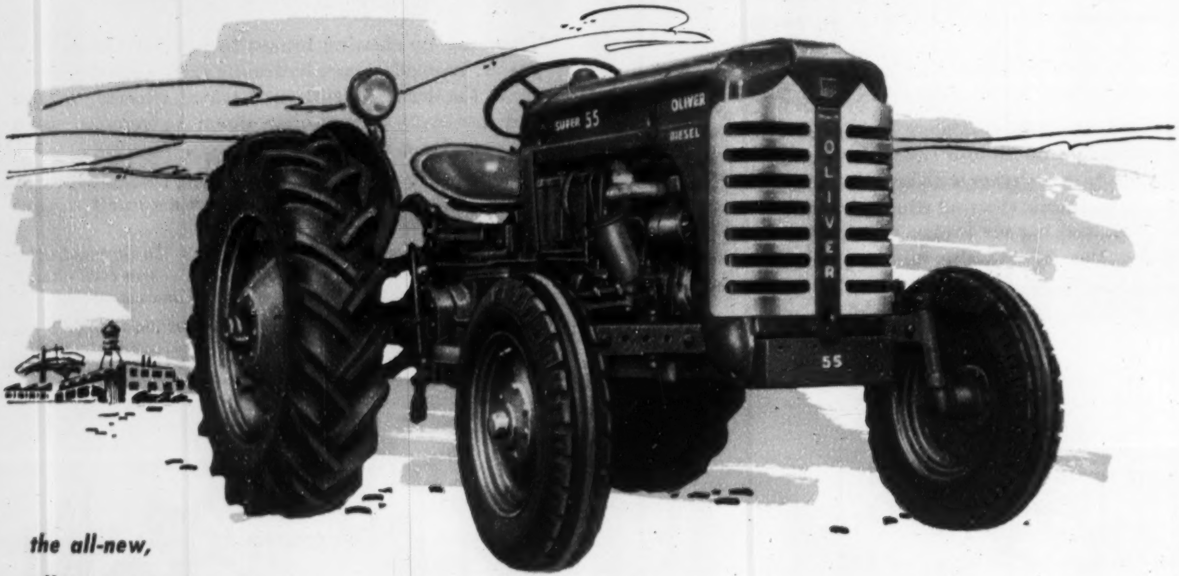
Not only the most powerful, but a huskier, heavier tractor and the *only* one to offer a choice of diesel or gasoline power. Two modern, low-friction, 4-cylinder engines designed to keep your costs at an absolute minimum.

Introducing
the Brand-New
OLIVER SUPER 55



the all-new,
all-purpose tractor
with everything!

Here is the tractor you have been waiting for. A tractor with all the features you have wanted...all the features that make other tractors its size out-dated! Waiting for diesel power? Super 55 has both diesel and gasoline. Want a tractor you can use anywhere, with any kind of attachment? Try the Super 55...its greater power, weight...its compact, maneuverable size...and its ability to take front-, rear- or side-mounted tools gives you versatility never before had in any tractor!

See and drive the new Super 55. Stop in at your Oliver Distributor, today!

SIX FORWARD SPEEDS—with a new super low of 1½ miles per hour. Gives greater power at slow speeds, less chance of engine stall-out.

LOW AND COMPACT—only 4½ feet high. 6-foot wheel base makes tight turns easy in close quarters.

BUILT-IN HYDRAULIC SYSTEM—internal control for 3-point hitch equipment. External control for mounted equipment.

DOUBLE-DISC BRAKES—give four times the braking surface, yet require half the foot pressure of band brakes.

EASY STEERING—recirculating ball-type steering reduces operator fatigue. Makes steering in soft ground much easier.

INDEPENDENT REAR PTO—constant-running power take-off is independent of tractor clutch. No power breaks when shifting gears!

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400 West Madison Street, Chicago 6, Illinois

OLIVER

a complete line of industrial wheel and crawler tractors

Men and Jobs briefs . . .

• **Careers—Harold O. Bolz,** formerly of Purdue, joins the staff of Ohio State as associated dean of the college of engineering . . . **Joseph A. Keith,** head of the J. A. Keith Construction Co., becomes the first director of public works for Pawtucket, R. I., under the city's new charter . . . **Capt. J. F. McElhenny** is resident engineer at Offutt Air Force Base, near Omaha, succeeding **Lt. Col. R. E. Mathe,** now assigned to staff school . . .

Chester F. Langtry, formerly the city engineer for Keene, N. H., becomes town engineer and director of public works for Weathersfield, Conn. . . . **O. L. Hooper** named chief hydraulic engineer for Stone & Webster . . . **Capt. R. E. Bassler,** recently retired as a Navy engineer officer, has become director of public relations for the University of Tampa, Fla. . . .

H. Senne, Jr., formerly of Missouri School of Mines, joins the engineering teaching staff at Iowa State University . . . **R. E. Krucklin** becomes head of the material and control department, North Atlantic Constructors, on Greenland base construction projects.

• **Retirements—Turner F. Loughborough,** who supervised all highway construction for the Virginia Department of Highways, retires after 20 years of service . . . **Julius E. Graf,** since 1947 chief engineer for Jones & Laughlin.

• **Associations—E. S. Tisdale** becomes a director of the Interstate Commission on the Potomac River Basin . . . **R. C. Higginbotham,** to president of the Home Builders Assn. of Greater St. Louis.

Wade Thomason, Madison County engineer, named president of the Tennessee County Highway Officials Association . . . **Henry Kunz,** president of Kunz Paving Co., San Mateo, becomes first president of the Northern California Chapter, Excavating and Grading Contractors Assn. . . . **J. J. Black,** Atlanta, new president of the Georgia Branch, AGC . . . **Joseph A. McNeil,** Los Angeles general contractor has been named chairman of the California State Contractors' License Board. . . .

Harold H. Funk, industrial engineer who has played a prominent role in the activities of the New York State Society of Professional Engineers, has become the society's new executive secretary.

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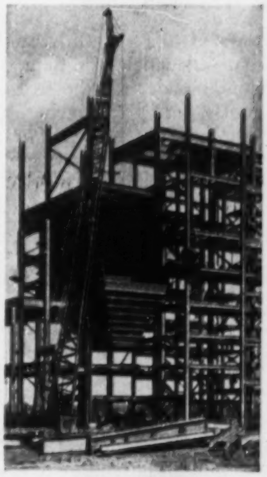
Contacting International early in their planning has proved soundest profits "insurance" for builders in every field of construction. The above coupon brings you graphic proof that International can serve *you* better too!



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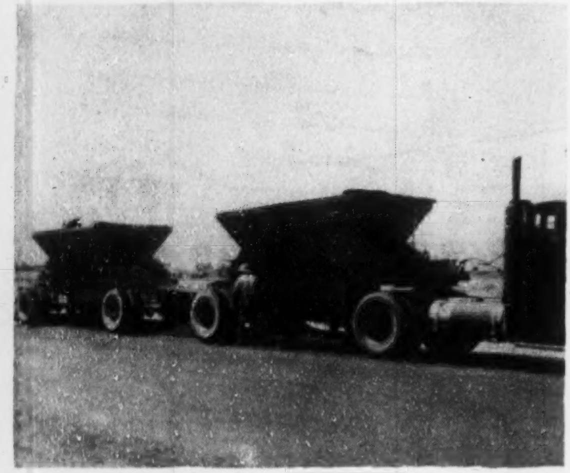
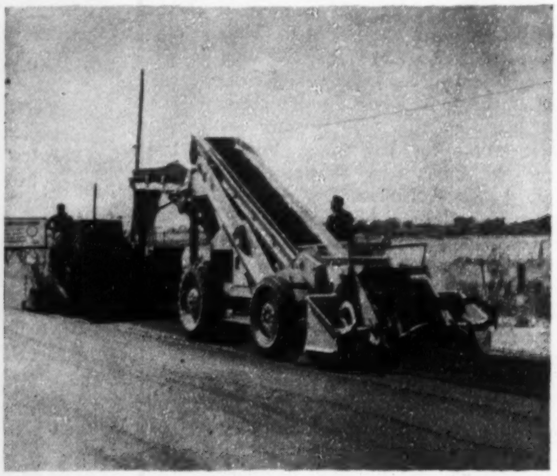


TWO 12-TON BOTTOM-DUMP trailer units hooked up in tandem lay down a windrow of hot asphalt paving material on a highway job in West Sacramento, Calif.



LOADER, feeding windrow to paving machine, had been required on other phases of the job and was used for paving even though rather elaborate for the job.

Bottom-dumps cut paving costs for asphalt overlay job in California

Fred N. Finn
District Engineer,
The Asphalt Institute
Sacramento, Calif.

Bottom-dump trailers have set a new pattern in asphalt paving in West Sacramento, Calif. The trailer units laid down carefully proportioned windrows of hot plant-mix asphalt paving material which was then spread by a motor grader for the first, or leveling course, and by a paving machine for the surface course. The California Division of Highways project called for a 3-in. plant mix overlay on approximately three miles of existing pavement.

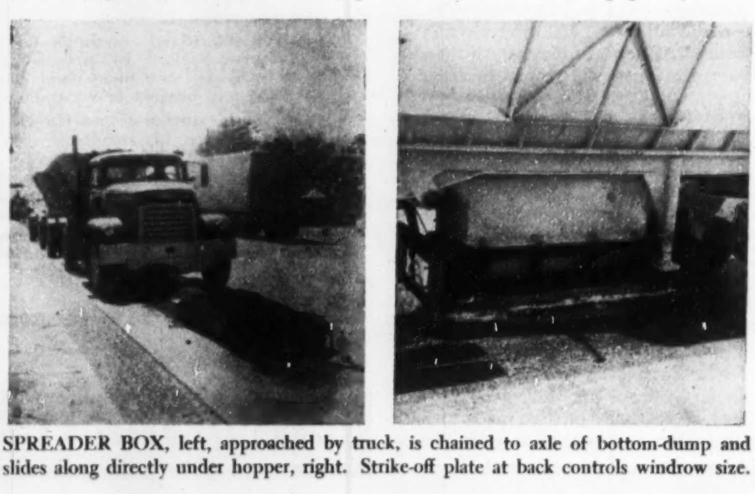
• **Long haul from the plant**—As the contractor for the job had selected an asphalt plant which involved a 52-mile round trip to the job, he decided to use hauling units capable of transporting 24 tons per trip. Equipment like the 12-ton bottom-dumps he employed, hooked up in tandem, had been used for hauling rock and cement for highways, but it was the first time that they were used to haul hot asphalt paving material.

By employing bottom-dumps instead of 12-ton end-dump trucks, the contractor reduced the cost of hauling materials from $1.60 per ton for leveling course, and $1.76 for surfacing, down to $1.32 per ton. These figures are based on published rental rates for the various equipment, including the contractor's use of a loader for feeding the windrow to the paving machine on the surface course work. The average daily tonnage was 1,000 tons per 10-hour day. In figuring the unit costs the contractor assumed that enough trucks would be used to keep the paver constantly at work. This was the case in using the bottom-dumps, and in one instance the paver spread 230 tons of material without stopping.

To size the windrow of paving material dumped from the bottom-dump units, the contractor had to devise a spreader box which would permit the shaped windrow to be picked up and spread properly. The simply constructed spreader box is connected by chains on each leading edge to the axle of the bottom-dump unit. A strike-off plate on the back of the spreader box sizes the windrow and can be adjusted.

Although a motor grader was the only thing used in spreading the windrow for the leveling course, a loader pushed by a paving machine was used to transfer the windrow for the surface course to the paver. The loader might be considered elaborate for this type of work, but it had been required for other phases of the job and was available for use.

(Continued on page 74)



SPREADER BOX, left, approached by truck, is chained to axle of bottom-dump and slides along directly under hopper, right. Strike-off plate at back controls windrow size.

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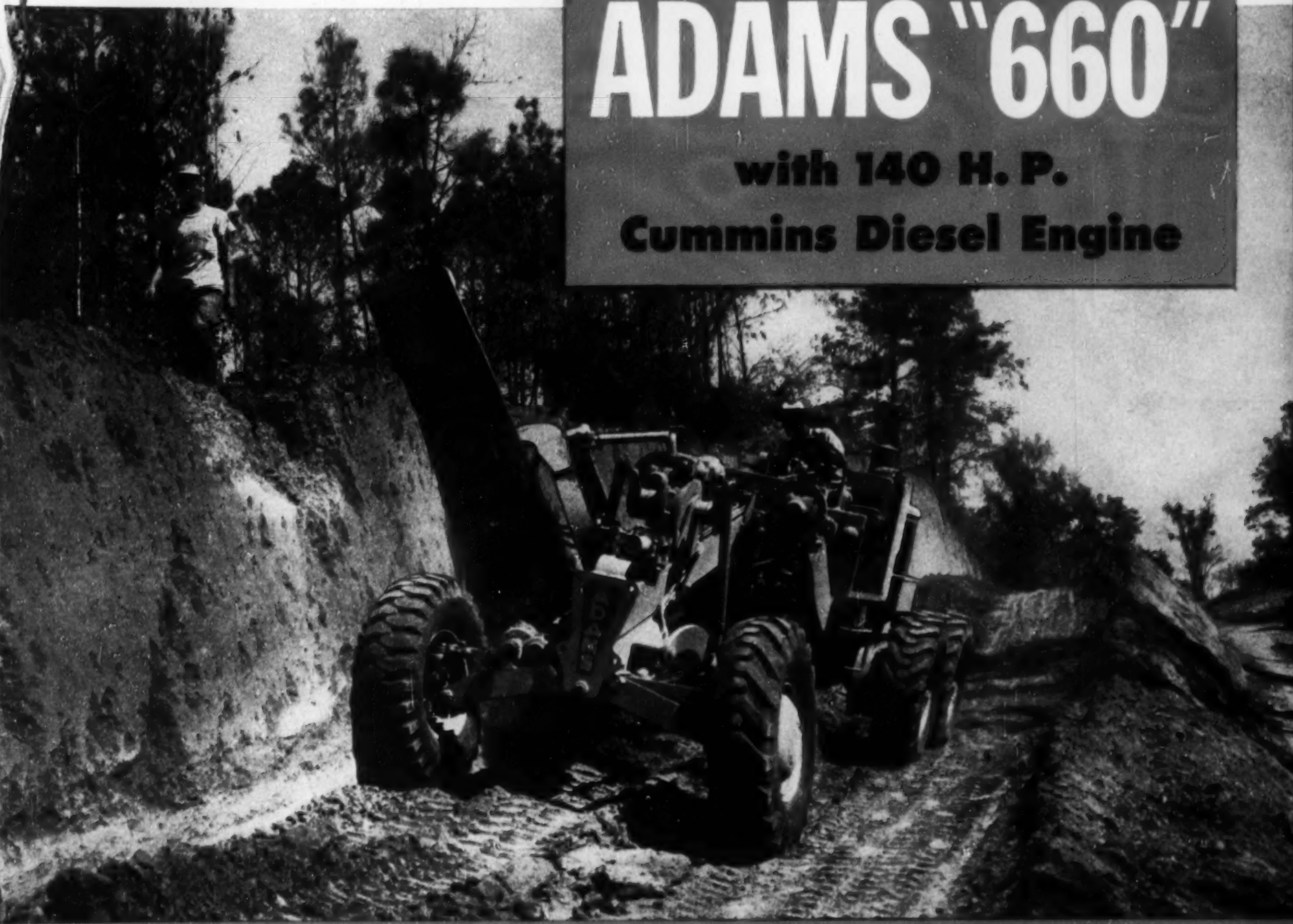

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Opening up the

HEAP LOADS IN A HURRY. One of Julian Construction Company's seven TD-24s push-loads a new INTERNATIONAL 2T-75 near Wauseon, Ohio. Julian has 1,000,000 cubic yards of dirt to move in sub-grading 7.2 miles of the Ohio Turnpike.

INTERNATIONAL TD-24 crawler tractors, preferred by contractors on toughest phases of Ohio Turnpike construction

An estimated 29,506,100 cubic yards of earth and rock is being excavated and an estimated 46,905,000 cubic yards of borrow and fill will be moved before the 241.1-mile Ohio Turnpike is completed.

A monumental project, requiring the most powerful, most dependable crawler tractors available.

All along the Ohio Turnpike, from the eastern terminus in Mahoning County to the western terminus in Williams County, INTERNATIONAL *TD-24 crawler tractors are taking over the toughest earthmoving jobs.*

With 155 drawbar horsepower, the INTERNATIONAL TD-24 can conquer any big job. And the durability of every TD-24 means less maintenance, downtime, and operating expense, more profit for the owner.

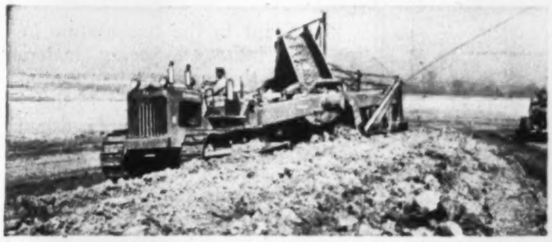
For more details on the new, complete line of INTERNATIONAL earthmoving equipment, including seven crawler tractors with 26 matched blades, two high-speed rubber-tired tractors with scrapers and bottom dump wagons, and four 4-wheeled scrapers, call your INTERNATIONAL Industrial Power Distributor today. While you're at it, arrange for a demonstration on *your* job of INTERNATIONAL equipment "sized" for *your* job.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

Ohio Turnpike

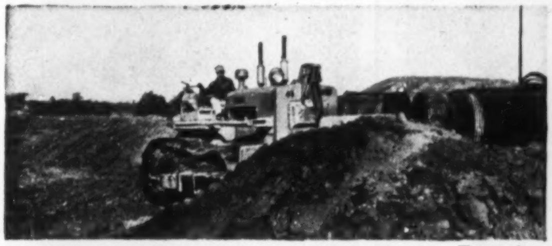
SMOOTHING A BRIDGE APPROACH. Largest structures on the Ohio Turnpike are twin bridges north of Akron. Over 1,500,000 cubic yards will be moved by Wilco Builders, subcontractors, Brecksville, Ohio, with two TD-24s leading the way.

DOES MORE THAN ITS SHARE FOR CENCI. Subcontractor Nick Cenci and Sons, Inc., Columbus, Ohio, use an INTERNATIONAL TD-24 for the heaviest heaped-loading work. TD-24 recently push-loaded 450,000 yards of earth with no downtime.



LOADS THEM OUT FOR LAUNDER AND PIERCE. An INTERNATIONAL TD-24 hauls a loader on a 28 to 36-inch cut. Contract for this section is held jointly by Launder and Son, Inc., and The Pierce Construction Company, Toledo, Ohio.

SPEEDS SOIL-STRIPPING FOR SMALLEY. Approximately 3,600,000 cubic yards of earth will be moved by D. R. Smalley and Sons, Celina, Ohio. One of their three TD-24s is used to pull a loader on soil-stripping work near Milan, Ohio.



HANDLES THE TOUGH ONES FOR HERKNER. Extensive drainage is required through Summit and Cuyahoga Counties. Herkner Construction Company, Cleveland, uses the TD-24 shown here to handle excavation and drainage pipe placement.

LOADING IN MAHONING COUNTY. Two of D. W. Winkleman's five TD-24s complete fast cycles in spite of soggy going south of Youngstown. Roughly three-and-a-quarter million cubic yards will be moved on this contract.

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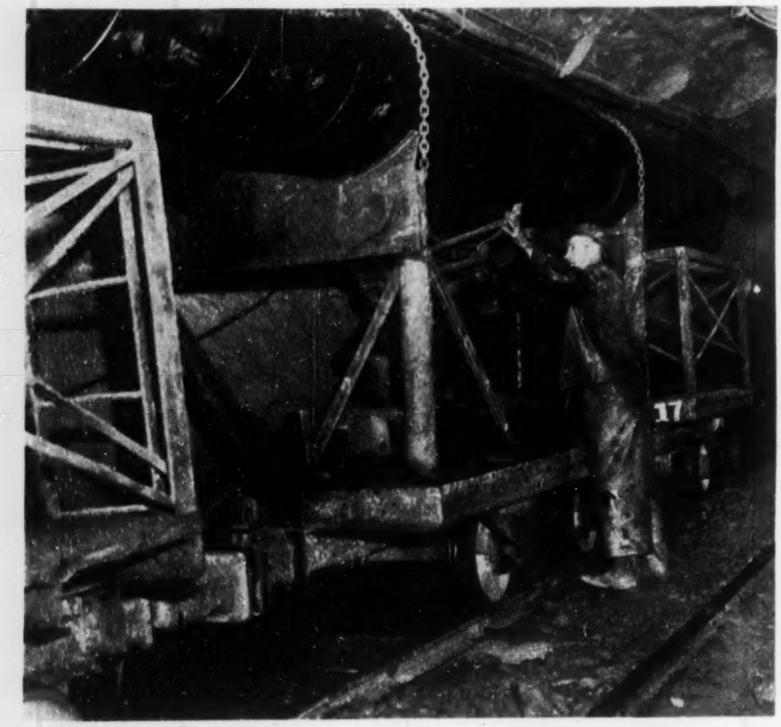

To go places underground, you've got to take fresh air with you and get rid of stale air, gases and fumes. And the easiest and most dependable way to do this is through Naylor light-weight pipe. Built with the exclusive lockseamed-spiralwelded truss, Naylor provides the added collapse strength and safety for push-pull ventilating service. It's easy to handle and install—easy to extend as work progresses—particularly with the Naylor one-piece Wedge-Lock coupling to speed connections and simplify the job. Check up on this pipe and coupling combination and find out how much it can do for you. Write for Bulletins No. 507 and No. 514.

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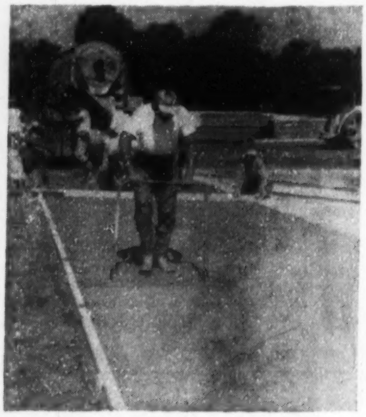
• **Anticipated trouble**—Segregation of paving material in forming the windrow and loss of temperature in the windrow were both anticipated prior to the actual job. However, there was no particular evidence of separation in the windrow or in the dropping of material from the loader into the paver hopper.

There was an appreciable loss of temperature in the windrows, but as long as material was not windrowed to far ahead of the loader, temperatures were within range for proper spreading and rolling. Actual temperature loss between dumping and spreading was reported as being 35-40 deg, with an average dumping temperature of 275 deg F. In order to remain within the proper range, engineers did not allow more than one unit, or 24 tons, to be windrowed in advance of the loader—or a distance of about 270 ft.

Significant to the temperature loss in the windrowed paving material is the fact that ambient temperatures ranged from approximately 75 deg F. during the mornings to 95 deg F. during the afternoons.

Contractor for the job was Ukropina-Polich-Kral, San Gabriel, Calif., who worked with Miles and Sons Trucking Service in working out the hauling method.



Expanded metal tamper aids settling concrete slabs

The Gellatly Const. Co. has reportedly eliminated several rough screeding and floating passes through the use of a job-made tamper constructed of expanded metal and strap iron. Designed for use on unreinforced floor slabs, particularly those poured on ground, the tamper is applied to the slab to squeeze out entrapped air and reduce voids and honeycombs. After this treatment a mechanical finisher can be used.

A pipe dream come true!

New, rot-proof, shrink-proof, high thermal efficiency

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for low pressure steam lines, hot and cold water lines!

The day has come—no more rotting, shrinking, absorbent, *costly* insulation on your low pressure steam lines, your hot and cold water lines!

New Fiberglas Low Pressure Pipe Insulation is here—the first major improvement in low pressure pipe insulation in over 30 years—tested and proved in three years of trial applications!

Made of inert fibers of glass, this pipe dream come true will not rot, shrink, swell, buckle, sag, or contribute to corrosion. It's lightweight, resilient, moisture resistant, *and up to 50% more efficient thermally than old insulations used in low pressure service.* Best of all . . .

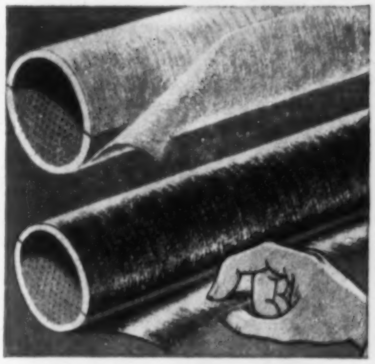
New Fiberglas Low Pressure Pipe Insulation is priced right in line with ordinary insulations!

Which means that for any given installation it's actually cheaper. For thanks to higher efficiency, Fiberglas Low Pressure Pipe Insulation does the same insulating job as thicker, old-type insulation on hot piping—and it lasts and lasts. The properly located vapor barrier (on the outside of pipe insulation) helps avoid condensation, adsorption and resultant corrosion of pipe and deterioration of insulation.

Also, Fiberglas Low Pressure Pipe Insulation saves space and offers less surface for painting requirements.

Whatever the application—low pressure steam, hot or cold water—Fiberglas Low Pressure Pipe Insulation pays for itself time and time again. Moreover, it's easy to cut and handle, fast and economical to install. Jackets designed for hot and cold service are factory applied at no additional cost.

Full information is now available in a new 4-page technical bulletin. To get your free copy immediately, mail the coupon now!



New Fiberglas Low Pressure Pipe Insulation comes in pre-formed, easy-to-apply sections for standard pipe up to 12", all copper tubing up to 3" in diameter. Finishes, including vapor barrier for anti-sweat cold water applications, are *factory applied.*

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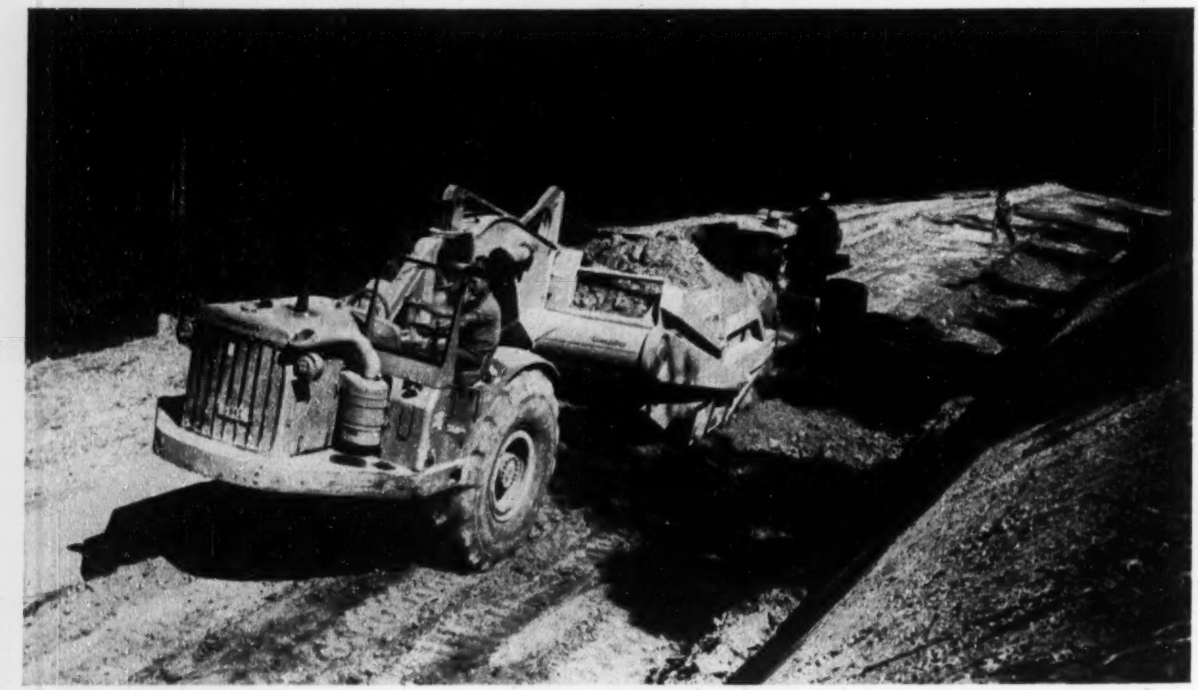
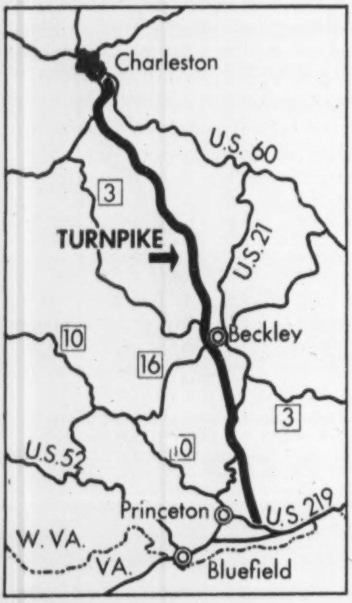


A DW21 with No. 21 Scraper, owned by Oman Construction Co., is push loaded on a section of the turnpike near Beckley, W. Va.

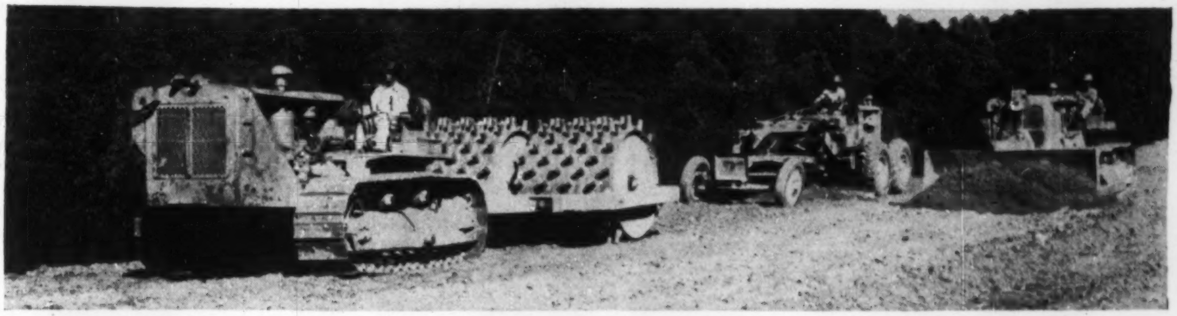


The 88-mile West Virginia Turnpike is expected to be ready for use this fall. Built through mountainous country for most of its length, the project has required moving some 31,000,000 cubic yards of earth for fill. During the spring and summer 3,000,000 tons of crushed rock has been spread in a 14-inch blanket, the full width of the grade, and 1,600,000 square yards of concrete paving have been laid.

This huge earthmoving job has been handled fast. During good weather a million cubic yards a week was the regular rate, and a high percentage of the material was rock.

With a maximum grade of 5 per cent, the new turnpike follows the sides of valleys throughout much of its length. The standard roadway is 50 feet wide, but many miles of extra-width grade have been built to take care of future dualization. Starting at 600 feet elevation in the Kanawha Valley near Charleston, the highway climbs to a maximum of 3200 feet at Flat Top, then descends to 2000 feet at Princeton.

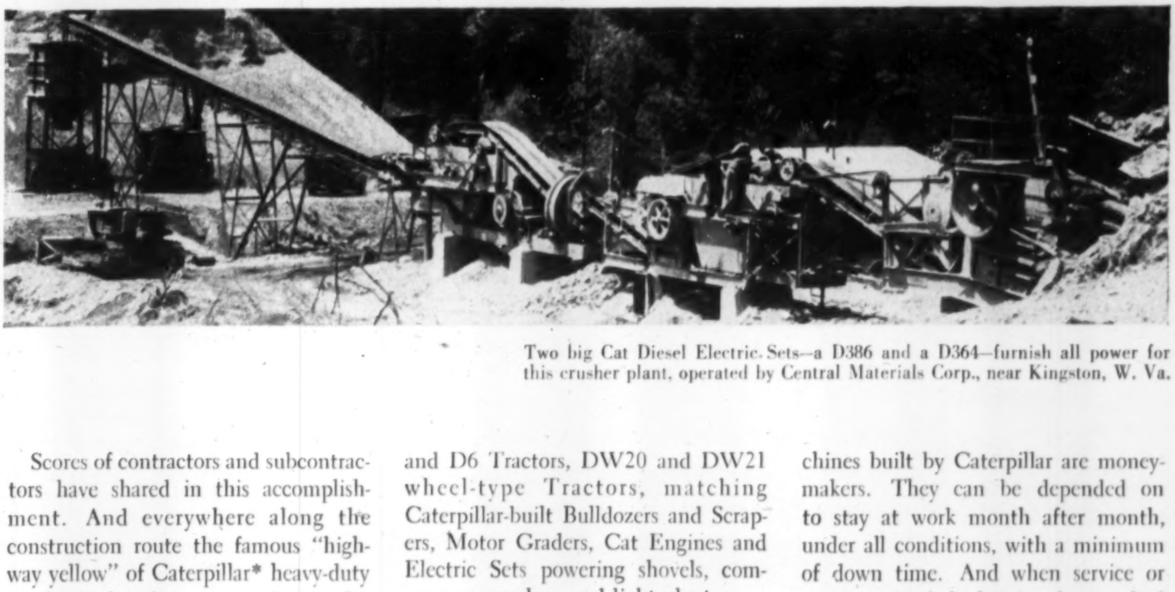
It is expected to cut driving time by half, reducing over a thousand curves in the old road and shortening the distance by 32 miles.



Pulled by a Caterpillar Diesel D8 Tractor, this sheepsfoot tamper compacts earth on the Beckley section of the turnpike.

This Cat No. 12 Motor Grader works over new fill while a DW21 wheel Tractor speeds past for another load.

Caterpillar DW20 Tractors with No. 20 Scrapers are used by Clark, Farrell & H. N. Rogers to move earth near Pax, W. Va.



Two big Cat Diesel Electric Sets—a D386 and a D364—furnish all power for this crusher plant, operated by Central Materials Corp., near Kingston, W. Va.

Scores of contractors and subcontractors have shared in this accomplishment. And everywhere along the construction route the famous "highway yellow" of Caterpillar* heavy-duty machines has been in evidence. Included in the equipment are D8, D7 and D6 Tractors, DW20 and DW21 wheel-type Tractors, matching Caterpillar-built Bulldozers and Scrapers, Motor Graders, Cat Engines and Electric Sets powering shovels, compressors, crushers and light plants.

Experienced contractors know machines built by Caterpillar are money-makers. They can be depended on to stay at work month after month, under all conditions, with a minimum of down time. And when service or parts are needed, they can be supplied by the nearby Caterpillar Dealer.

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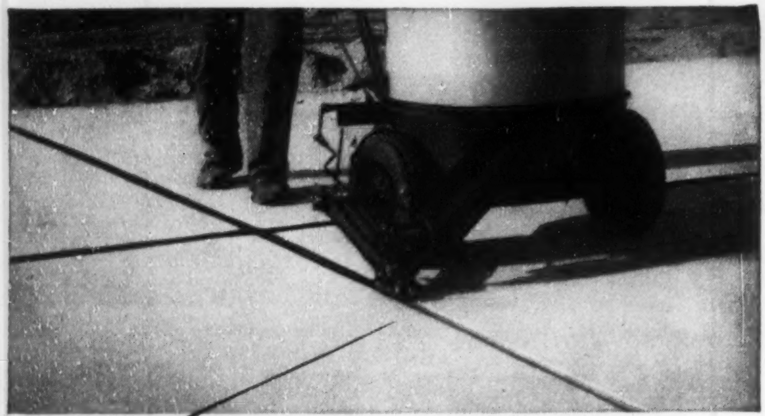

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OBITUARIES

Willard F. Pond, 72, a consulting engineer for Rochester, N. Y., died August 1. Prior to joining the city's engineering staff in 1948, he was associated with the Baltimore & Ohio Railroad for 43 years, most recently as assistant to the regional engineer. He was a graduate of Cornell University.

William L. Gruhler, 65, Philadelphia building contractor and president of William J. Gruhler Co., died July 27. He was graduated from the University of Pennsylvania in 1910.

Fred J. Lichtefeld, 70, general contractor in Louisville, Ky., for nearly 50 years, died July 29. He received his first training as a carpenter in a planing mill, later entered the contracting business as a partner in the firm of Lichtefeld, Metzner & Co. This company was dissolved in 1934 when Fred J. Lichtefeld & Son was formed.

Hyland P. George, 63, president of George & Lynch, Inc., Wilmington and Dover, Dela., contracting firm, died August 7 in New York City. He was responsible for engineering work on such projects as Delaware Park, Fort Miles, the dam across New Jersey's South River and the Rocket Proving Ground near Wilmington, N. C. He received his engineering degree in 1913 from the University of Delaware.

Walter H. Sears, 73, former supervising engineer with the Navy's Bureau of Yards and Docks, Washington, D. C., died at Stoneham, Mass., August 8. At one time a private consultant, he later served as an engineer with the Boston Metropolitan District Water Supply Commission.

Charles Hinze, 42, district superintendent of the Bureau of Reclamation's Big Horn Basin project in Wyoming, died August 6. He had been stationed at Cody, Wyo., since 1949. Before that he was superintendent of the Bureau's Canyon Ferry project with headquarters at Helena, Mont.

Earl M. Dennis, 77, a retired bridge contractor, died August 5 in Dunbridge, Ohio.

George Duggan, 63, a civil engineer for the New York State Department of Public Works, died July 31 in Hudson, N. Y. He had worked for the state for 45 years.

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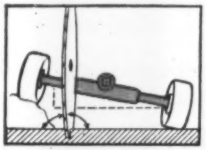

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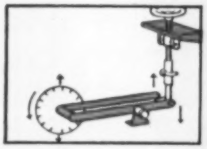

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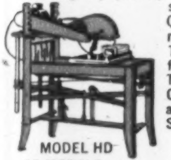

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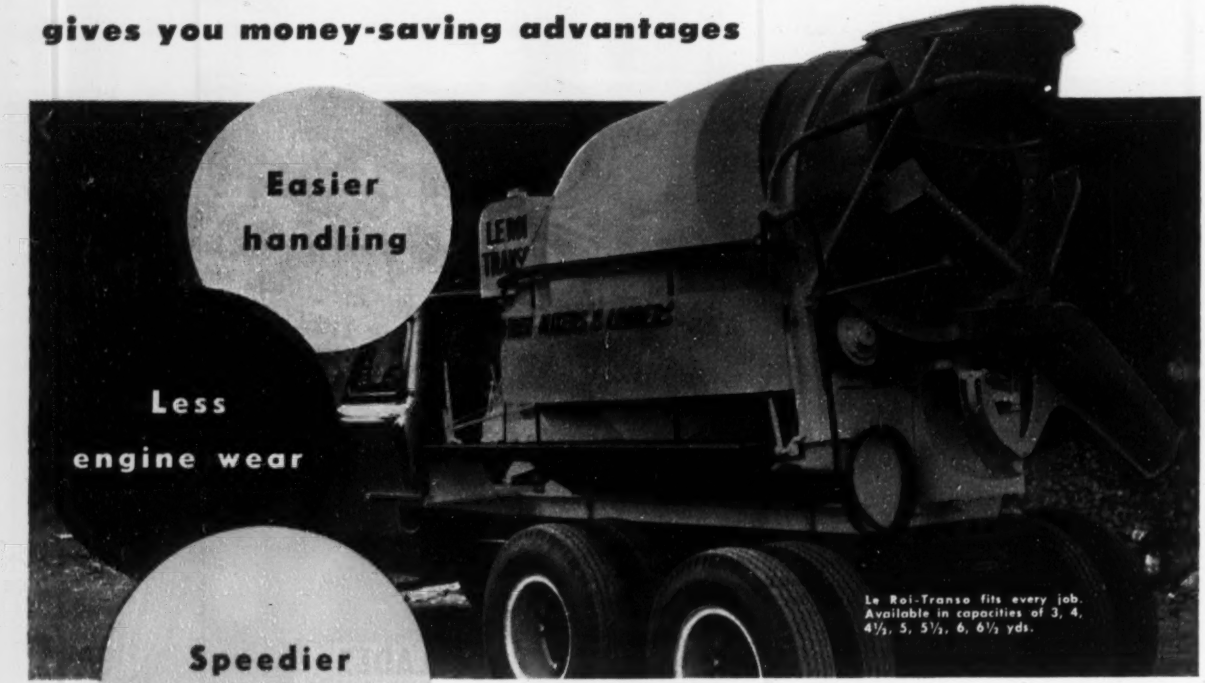

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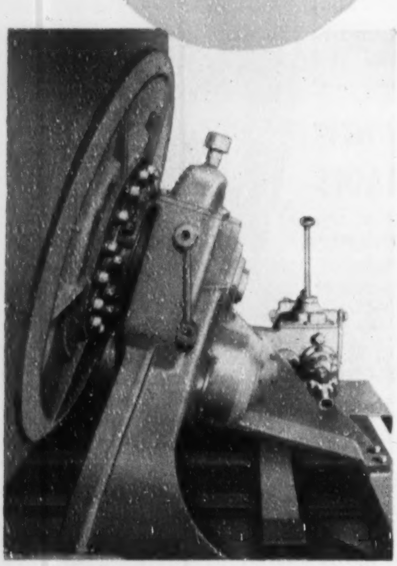

Patented Le Roi-Transo direct drive eliminates heavy chains, ring gears, sprockets, and bevel gears — and the maintenance troubles that go with them. Cuts dead-weight as much as 1,000 pounds.

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BOOKS

Making salt water fresh

Fresh Water from the Ocean: For Cities, Industry and Irrigation—By Cecil B. Ellis and others. 217 pp. The Ronald Press Co., 15 East 26th St., New York 10, N. Y. $5.00.

This book is the result of a study sponsored by The Conservation Foundation and undertaken by the author and members of the staff of Nuclear Development Associates, Inc., of White Plains, N. Y.

It was the intent of the study to set forth in non-technical terms the basic matter and energy relationships with which any salt-water conversion method must be concerned, for the purpose of promoting fruitful research. The intent is well carried out in this lucid explanation of where desalting of salt-water now stands. Whether the ultimate purpose of the study is achieved and further fruitful research is inspired by this book depends on who reads it. Anyone interested in water supply, for whatever purpose, should read it.

The author tells what is in sea water, how much of it has to be gotten out for various uses, and how, in general, this can be done. The general methods he breaks down into external forces (electric, magnetic); forces applied to the container (centrifugal, acoustic, thermal); sieve action through surfaces; adsorption; and operations on individual ions or molecules.

Each general method is investigated costwise for a specific example — a 1,000-mgd water supply. The example taken is about the demand of New York City, or enough water to irrigate 18 sq mi of arid land.

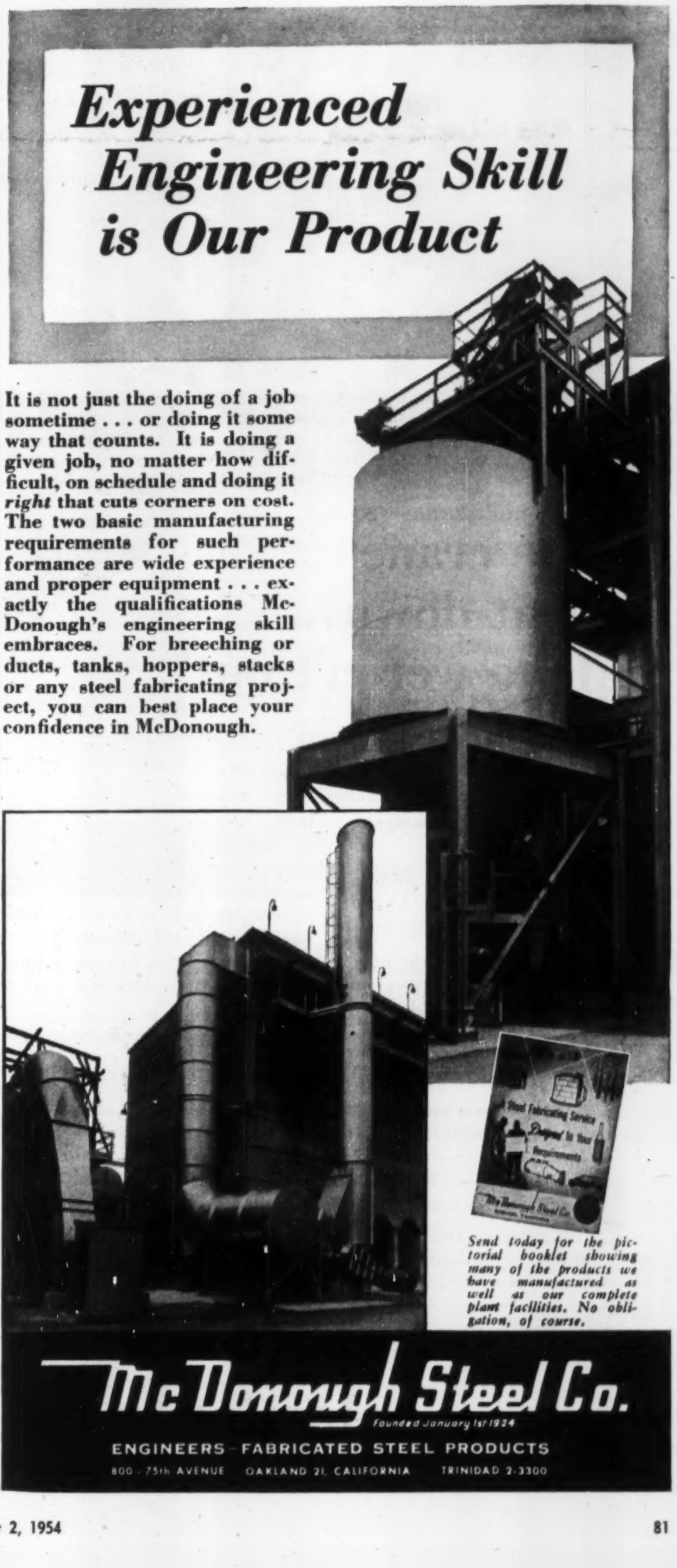
The study concludes that within perhaps 10 years it should be possible to extract fresh water from the sea on a large scale at a cheap power location for about 30 cents a thousand gallons. This is a price many large cities and industries might afford if no lower cost water were available to them. The author expects the electric membrane method to be the cheapest and sees great promise in development of these membranes, now but two years old.

Text on welding methods

Welding Engineering—By Boniface E. Rossi. 786 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $8.

Engineers interested in improving

(*Continued on page 82*)



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Send today for the pictorial booklet showing many of the products we have manufactured as well as our complete plant facilities. No obligation, of course.

McDonough Steel Co.

Founded January 1st 1924

ENGINEERS–FABRICATED STEEL PRODUCTS

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The crane went down... but we weren't out!

Our Hartford Contractors' Equipment policy paid us $8,269.02 *(Based on Company File #HM53-2037)*

We were wrecking an old bridge to make way for a wider one.

The structure appeared sound. So we brought up our 32-ton crane, and used it for removing the bridge deck.

That wasn't such a bright idea. We'd hardly started when the abutment under the rig collapsed with a roar. The operator jumped clear as the machine toppled into the river.

It cost nearly $900 to get the machine to a shop for repairs. And over $7,300 more to fix it up. Under our Contractors' Equipment policy, the Hartford Fire Insurance Company paid these bills – a total of $8,269.02.

Who'd pick up the tab if one of *your* machines "fell in"?

Or was burned? Wrecked in a collision? Buried under a landslide?

Not you—if you had the broad protection of a Hartford Contractors' Equipment policy. It covers your equipment on the job . . . while being moved from one job to another . . . while idle between jobs. It saves you from loss caused by collision, overturn, explosion, theft, windstorm and many other hazards.

The cost of making sure you have cash when you need it for repairs or replacement is very reasonable. Get full details today from your Hartford Fire Insurance Company Agent or your insurance broker.

Year in and year out you'll do well with the

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their knowledge of welding techniques will find this text helpful. The book was written not only to familiarize students and beginners with fundamentals, but also to give those now in the welding field a wider understanding of the process and to serve as a useful reference.

Techniques described include inert-gas-shielded arc, submerged-arc, pressure-gas, stud, induction and flow welding. In addition, some topics that never before have been treated, as far as the author knows, are covered in this book. These are cold welding multiple-electrode submerged-arc welding, some phases of inert-gas-metal arc welding with consumable electrodes, such as semiautomatic processes, and contact-arc and multiple-arc welding.

Fabrication problems are considered, and two chapters are incorporated on welding design. While various types of welded joints are discussed, the reader seeking specific applications to structures is likely to be disappointed.

Miscellaneous notes

- **Papers and discussions of nuclear power possibilities** presented at a meeting May 24 under the auspices of the Atomic Industrial Forum, have been published in a 100-page pamphlet, which can be purchased from the forum, 260 Madison Ave., New York 16, N. Y., for $5. Included is an authoritative explanation of the Atomic Energy Commission's five-year reactor development program and the approaches to nuclear power of several private firms.

- **The Code Manual** applicable to the New York State Building Construction Code has been expanded in a second edition to include multiple dwellings as well as one and two-family houses. The manual is useful as a guide to designers, builders and enforcement officials in the interpretation and application of the state code. Now available in a hard cover and ring binder to permit inclusion of supplemental pages, the 295-page book may be purchased for $3 from the State Building Code Commission, 1740 Broadway, New York 19, N. Y.

- **To determine** what fly-ash does to concrete, the National Sand and Gravel Assn. and the National Ready Mixed Concrete Assn. carried out a test program, which is reported in Publication No. 48, "Effect of Fly-Ash in Concrete." (Obtainable on request from NRMCA, 1325 E. St., N. W.,

(*Continued on page 84*)

WAHLEACH, BRITISH COLUMBIA

Another Penstock job made easier with DRESSER COUPLINGS

Lighter, high-yield steel pipe cuts tonnage, shipping, installation costs . . . speeds completion of 1760-foot Wahleach penstock.

Six weeks after construction began, this 70″ penstock—the fourth Dresser-Coupled installation made by the B. C. Electric Company—was ready to deliver water to a 75,000-kva power plant near Vancouver, British Columbia.

Eliminating extensive excavation, resilient gaskets in Dresser Couplings allowed the penstock to be deflected to the natural contour of the right of way. The lighter weight and longer lengths of high-yield steel pipe meant easier handling, fewer joints and anchors. A field crew of 20 men—with a minimum of skill, supervision and heavy equipment —*Dresser-Coupled 1,000 tons of steel penstock in 21 working days.* Under test, the line proved absolutely bottle-tight.

Dresser Couplings permitted faster completion of the line and assured permanently tight, maintenance-free joints. This resulted in *earlier revenue* from plant operation . . . *uninterrupted service* to power consumers.

BE SURE you get a *better, faster* penstock installation. Put high-yield steel pipe and Dresser Couplings in *your* specifications.

Above—Overbends made by 1° deflections at each field joint eliminated shop-made bends and special anchors.

Left—Four men averaged less than four hours making bottle-tight joint . . . 975 psi working pressure, 1500 psi shop test on couplings.

Project designed by B.C.-International Engineering Co., Ltd.
Penstock installation by Arrow Transfer Co., Vancouver

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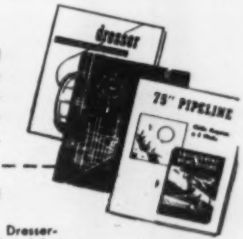

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Please send me your latest "Report of Dresser-Coupled Lines", and copies of your Expansion Joint and Style 38 Catalogs.

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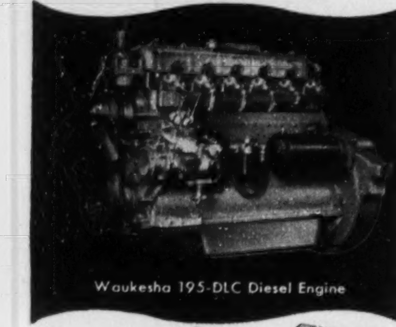


WAUKESHA POWER

... loading compacted sand and gravel ... or spotting railroad gondolas—at Custer, Wis., plant of the F. F. Mengel Co. of Wisconsin Rapids, Wis.

This 125-A Michigan 1⅝ cu. yd. tractor shovel *has* the extra power when it's needed. Because of the 195-DLC Waukesha Diesel Engine, 6-cyl., 4" bore x 4" stroke, 302 cu. in. displ.—engineered-and-built into the tractor shovel's Clark Power Train by the Clark Equipment Company, Construction Machinery Division, Benton Harbor, Mich. *Get Waukesha Engine Bulletin* 1624.

254

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

Washington 4, D. C., for 75¢). Chief conclusion: "From the standpoint of strength alone, it is probably seldom that the use of fly-ash will provide worthwhile economies for ordinary concrete construction." Basic reason for this statement is that the contribution of fly-ash is chiefly manifested at ages that are well beyond those upon which specifications generally are based.

• **Design criteria** for the one and two-person household typical of three-fourths of the aged are presented in a 17-page booklet, "Standards of Design, Housing for the Elderly," obtainable without charge from the Massachusetts State Housing Board, Boston, Mass. Sociological and physiological reasons for these criteria also are presented.

The booklet describes the characteristics of the aged that have to be considered and how to take them into account in laying out apartments, planning buildings, selecting sites and specifying stairs, floors, windows, lighting, sound control, hardware, bathroom and kitchen fixtures, heating and sanitation.

New engineering books

HANDBOOK OF HYDRAULICS—Fourth Edition—By Horace Williams King, revised by Ernest F. Brater, 10-67 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $8.00.

OUR ARMY ENGINEERS—By Irving Crump, 274 pp. Dodd, Mead & Co., 432 Fourth Ave., New York, N. Y. $3.00.

AIR POLLUTION ABATEMENT MANUAL—Edited by C. A. Gosline. 57 pp. Manufacturing Chemists' Association, Inc., 1625 Eye St., N. W., Washington 6, D. C. $6.00. (Limited free distribution to public officials in pollution-control work).

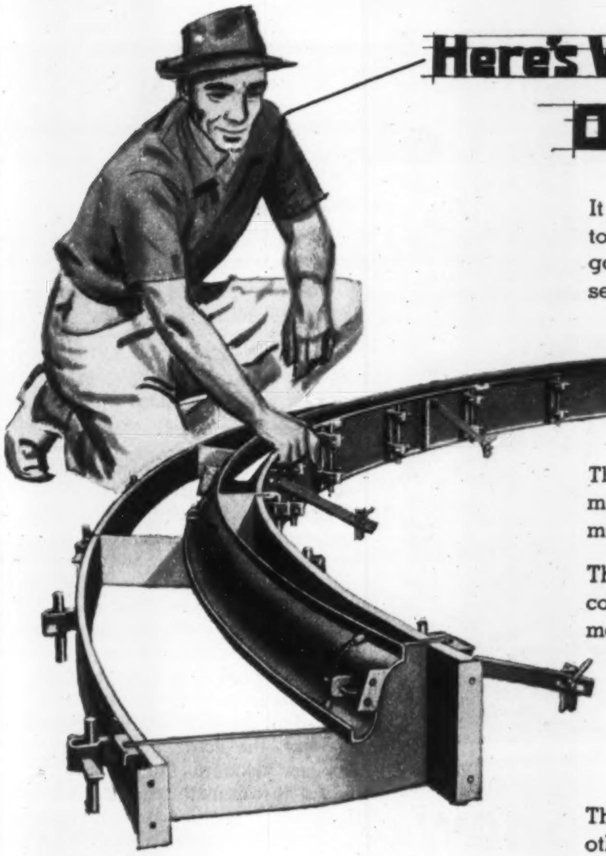
DAMS AND CONTROL WORKS—Third Edition. U. S. Bureau of Reclamation. 218 pp. Obtainable from the Superintendent of Documents, Washington 25, D. C. or the Bureau of Reclamation, Denver, Colo. $2.75

Reports and pamphlets

FACTUAL REPORT OF MOVEMENT OF OUT-OF-STATE PASSENGER CARS ON OKLAHOMA HIGHWAYS—Department of Statistics, Oklahoma Department of Highways, Oklahoma City, Okla.

ENGINEERING PROPERTIES OF CHICAGO SUBSOILS—Engineering Experiment Station Bulletin No. 423, University of Illinois, Urbana, Ill. $1.00

Here's Why HELTZEL Forms Outperform All Others



It takes more than a bending press and a welding torch to build practical, serviceable concrete forms. You've got to know concrete pouring and design for fast form set-up and quick stripping. You've got to know steel to design a form that can take punishment without being heavy and bulky. You've got to have wide experience in the construction field to design a versatile form that can cover a variety of installations.

The form must have strength, be easy to use, hold alignment under the most difficult conditions and deliver maximum wear.

These are a few of the reasons why formsetters and contractors alike **prefer Heltzel Forms.** Heltzel has almost 50 years experience in designing and building metal forms for construction use. Many of the features of the modern day form were developed by Heltzel engineers. And why not? They're the most experienced designers and builders of forms in business today.

That's why **Heltzel Forms** consistently outperform all others. That's why it's just smart business to make certain, when purchasing form equipment, you check first with the Heltzel representative nearest you. If you're not familiar with him write direct and we'll send his name and address by return mail together with the latest literature on Steel Forms.

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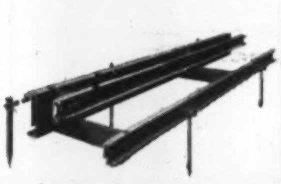
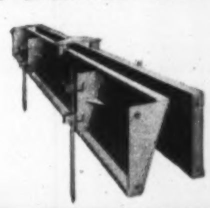
Curb and Gutter Forms

A Few Examples of HELTZEL Curb and Curb and Gutter PerFORMers..



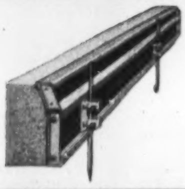
Interchangeable Face
Curb and Gutter Forms



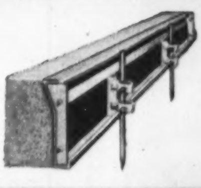
Battered Face Dowell
Joint Curb Forms

Straight Face Dowell
Joint Curb Forms

Rigid Radius
Curb Forms

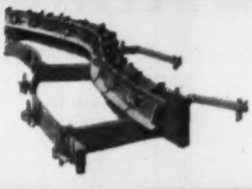


Two-Piece
Front Curb Forms



Single Piece
Front Curb Forms

Flexible Radius
Curb and Gutter Forms



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For Any Special Job

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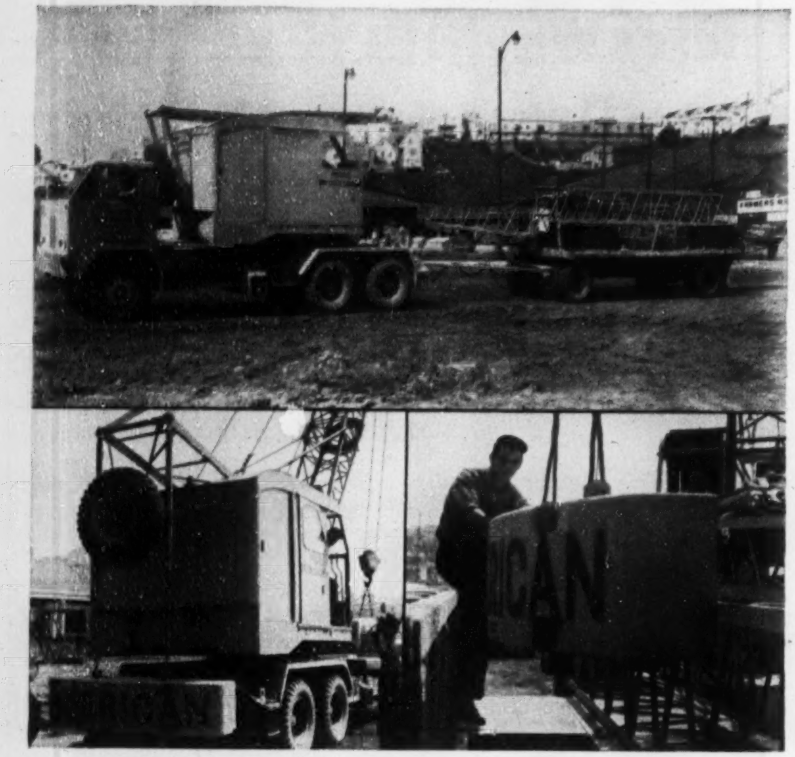

"Strip-Ease" Road Show

Highway weight restrictions in many states can tie up heavy equipment on one job when it is needed on another job. But the ease and speed with which their American 375 Truck Crane can be "stripped" and the parts loaded on a unique trailer have solved this problem for the Moore Dry Dock Co. of California.

The American 375 Truck Crane uses its own mechanism to remove its counterweight easily, above left. Then, it lifts the counterweight into the "belly" of a specially-designed trailer, above right. With the boom lowered into its cradle on the top of the trailer, the axle weight of the entire unit, top photo, meets most requirements for any highway in the state.

Weight restrictions are a problem in almost every locality. The current issue of the Crosby Clipper presents the complete story of how the Moore Dry Dock Company solved its problem with American equipment. If you are interested in this story, or in other time and money saving applications of American products, mail the coupon below. You will receive the Crosby Clipper regularly without charge.

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American Hoist & Derrick Company
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Yes, I'd like to get the American CROSBY CLIPPER.
Also, send information on the following equipment:
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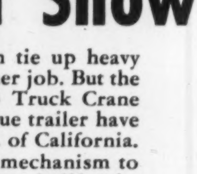


Send coupon today!

LEGAL

Radical changes in work may breach a contract

An oral contract was entered into for the construction of a house pursuant to certain plans and specifications for an agreed price of $25,000. After the foundation and the first floor of the house had been built, the owner decided to increase the size of the house and of the garage and to make other substantial changes in the work. The contractor thereupon told the owner that he could not complete the work for the stipulated contract price. When he was unable to reach an agreement with the owner as to what he should be paid for added work resulting from the changes, he abandoned the work and the owner employed another contractor to complete the job.

The original contractor brought an action to recover for the value of the work done by him and was granted a recovery, the court holding that the changes made in the work were so radical as to constitute a breach of contract, which entitled the contractor to recover fair and reasonable value of the work performed.[1]

(1) Glazer v. Lerman, 116 N.E. 2d 569, Supreme Court of Massachusetts, Dec. 30, 1953.

Right to make changes

The general contractor for the construction of a sewage treatment plant entered into a subcontract with another contractor whereby the latter was to install certain concrete pipes and caissons required according to the plans for the performance of the contract.

The contract gave the party for whom the work was being done the right to make changes in the work and provided that in the event such changes were made, the contract price would be increased or diminished in accordance with certain specified unit prices.

During the progress of the work, as a result of a jurisdictional labor dispute involving laborers hired by the subcontractor, the general contractor had the plans changed so that 52/60s of one item of work was eliminated and a different type of construction used.

Plaintiff subcontractor brought an action to recover on the basis of the lump sum bid for the item less the unit price deductions provided for in the contract and obtained a recovery.[1]

(Continued on page 89)

It's tire-tough, because it's built the way a tire is—with *an exclusive hose construction no other maker matches.*

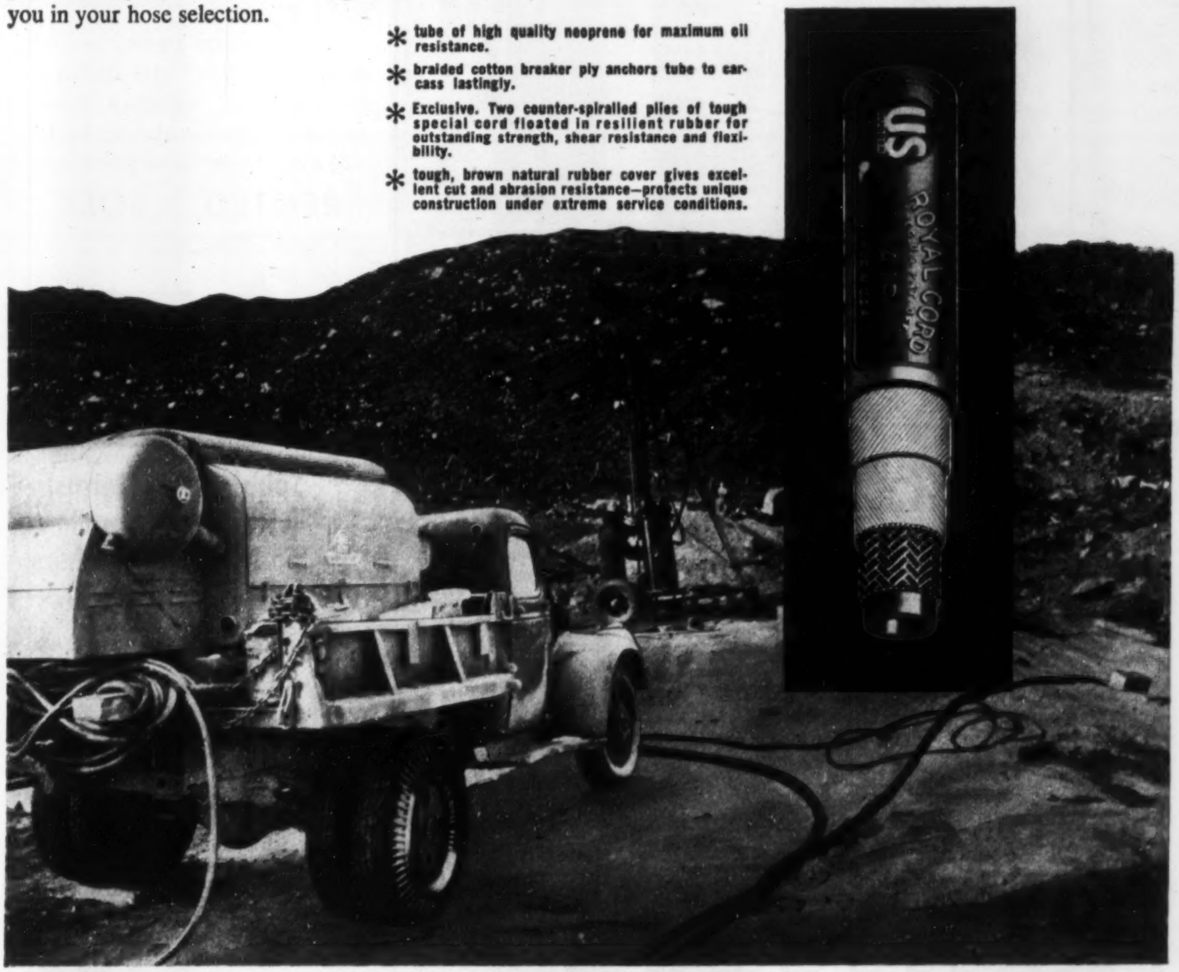
Proved in mines and quarries everywhere, U. S. Royal Cord Hose offers extremely high hydrostatic value, with a minimum of contraction and elongation. And with its great flexibility, shear resistance and toughness, it can be run over repeatedly by heavy equipment without harm.

Recommended particularly for applications where shock and excessive pressures are met, U. S. Royal Cord is available in continuous lengths from your "U. S." Distributor, any of our 27 District Sales Offices, or by writing to the address below. *Whatever* your hose requirement, you'll find it pays to turn to "U. S." There's a job-engineered U. S. Hose for practically every purpose—an expert staff of "U. S." engineers to assist you in your hose selection.

This hose took a tip from a tire!

U. S. Royal Cord Air Hose

* **tube of high quality neoprene for maximum oil resistance.**
* **braided cotton breaker ply anchors tube to carcass lastingly.**
* **Exclusive. Two counter-spiralled plies of tough special cord floated in resilient rubber for outstanding strength, shear resistance and flexibility.**
* **tough, brown natural rubber cover gives excellent cut and abrasion resistance—protects unique construction under extreme service conditions.**



"U.S." Research perfects it . . . "U.S." Production builds it . . . U.S. Industry depends on it.

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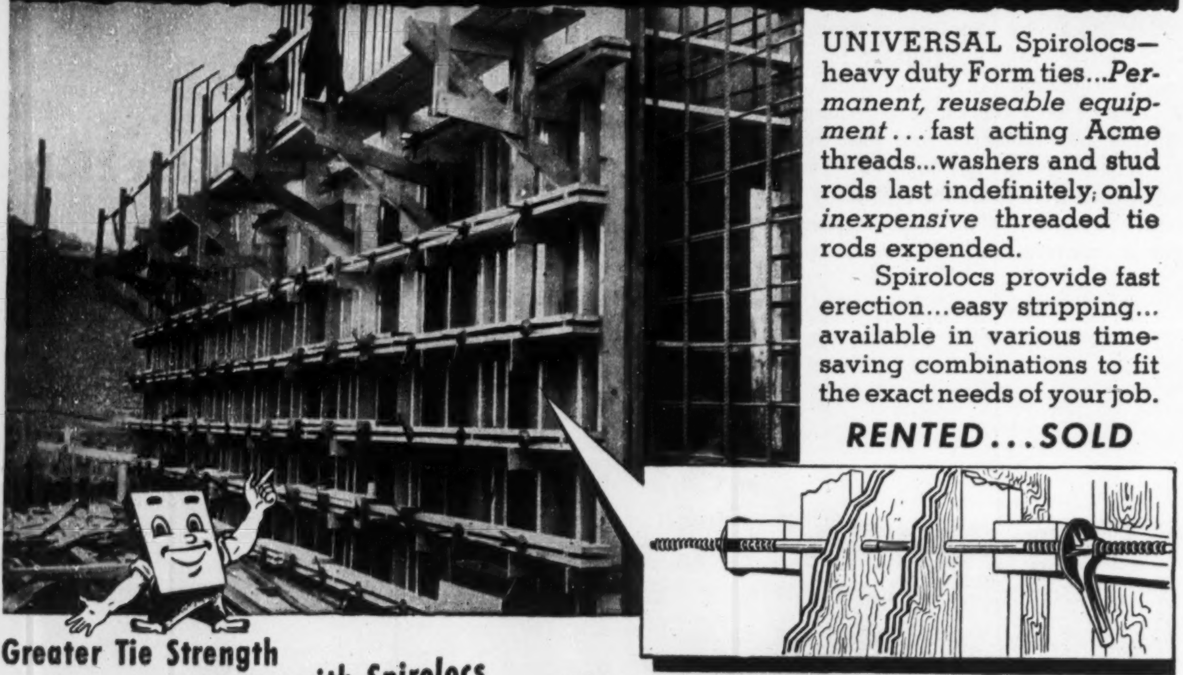
FASTEST—SAFEST—LOWEST COST



UNIVERSAL Spirolocs—heavy duty Form ties...*Permanent, reuseable equipment*... fast acting Acme threads...washers and stud rods last indefinitely, only *inexpensive* threaded tie rods expended.

Spirolocs provide fast erection...easy stripping... available in various time-saving combinations to fit the exact needs of your job.

RENTED...SOLD

Greater Tie Strength

For less money with Spirolocs

5,000# Ties with ⅜-Tie Rods
9,000# Ties with ½-Tie Rods
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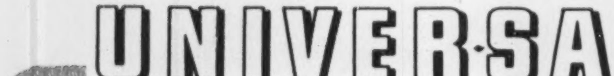
SPIROLOC CONE NUT ASSEMBLY



The only fast acting form Tie with an absolutely positive spreader...assures smooth surfaced, watertight walls.

Write for complete details on SPIROLOCS and ask for catalog describing Universal Form Tying Accessories.

Spirolocs are Furnished with either Handle or Nut Type Washers

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(ENR, June 17, 1954, p. 88). This judgment, however, was reversed on appeal,[2] the Appellate Court holding that the unit prices stipulated in the contract for adjustment of the contract price, in the event of changes in the quantities of work to be done was intended only to apply to minor variations between the estimated and the actual quantities of work to be done and not to major change.

The amount of the judgment obtained by the subcontractor, on the basis of the unit prices set forth in the contract, gave him compensation for the work done that was out of proportion to the value of the same. The Appellate Court directed a new trial and indicated that the recovery of the subcontractor should be limited to the fair and reasonable value of the work done.

(1) New England Foundation Co. v. F. H. McGraw & Co., 113 F. Supp. 246.
(2) F. H. McGraw & Co. v. New England Foundation Co., 210 F. 2d 62, U. S. Court of Appeals, First Circuit, Feb. 2, 1954.

Limits on guarantees

A man in New Rochelle, N. Y., entered into an agreement with a real-estate development company to buy a piece of land on which the company was to build the new owner a house to plans and specifications that were made part of the contract of sale. The specifications contained the following stipulation: "The seller unconditionally guarantees the foundation, walls and roof against any and all defects for a period of one year from the date of delivery of premises."

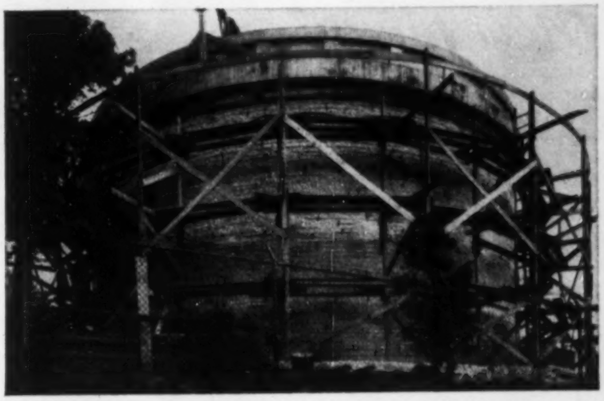
The house was completed Feb. 23, 1951, on which date the deed to the property was delivered to the buyer. Almost immediately extensive leakage developed in the cellar of the building.

The buyer thereupon gave the seller notice of the leaky condition and demanded that the necessary steps be taken to remedy the defects. The seller refused and the buyer brought an action to recover damages for breach of contract.

The court denied the buyer any recovery, holding that the seller had agreed to build the house in accordance with the plans and specifications and that he was not answerable for defects in the work which were not attributable to improper workmanship or to the use by him of improper materials.

The court held that the defendant's guaranty of the foundation, walls and roof against any and all defects for a period of one year from the date of

(Continued on page 90)



CEMENT GUN COMPANY PRE-STRESSES AND RESTORES *EXISTING* WATER TANK

The progress picture above shows a stage of our repair work on a concrete water tank in New England. This tank was completely lined with reinforced "GUNITE" to stop seepage which had caused serious disintegration to the exterior of the tank. The entire outside of the tank was subsequently chipped and existing hoop rods exposed.

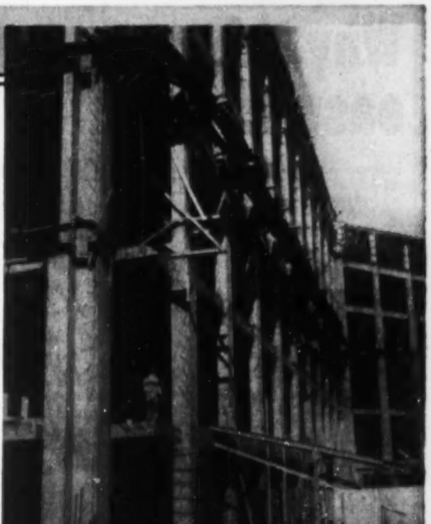
To strengthen the tank, wedges were driven behind the rods to take up the slack. This placed the rods in tension and the concrete in direct compression. Wire mesh was then attached to the reinforcing rods and the entire tank treated with two inch mesh reinforced "GUNITE."

The use of "GUNITE" for repair and construction of reservoirs, bridges, buildings, etc., is illustrated and described in Bulletin A 2400. We will gladly send a copy at your request. On your letterhead please.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.
MANUFACTURERS OF THE CEMENT GUN

CONNORS Offers 4 Important Advantages

★ Flexible Rolling Mills
★ Ample Bar Inventory
★ Fabrication Service
★ Fast Freight



Alabama's new State Office Building where Connors Reinforcing Bars were used.

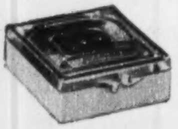
CONNORS STEEL DIVISION
H. K. PORTER COMPANY, INC.
OF PITTSBURGH
P. O. BOX 2562 • BIRMINGHAM, ALA.

Save time and trouble with the
New LUFKIN
WHITE-CLAD
MEZURALL TAPE RULE
with decimal markings

LUFKIN
WHITE CLAD
8 FT.
MEZURALL
W 928 D
ADD 2 INCHES FOR INSIDE MEASURE
1
2

● New Extra-Strong "Magic Metal" Featherweight Case

- Upper edge marked in 10ths and 100ths of feet; lower edge marked in inches to 16ths.
- New snow-white line with jet black markings tested and proven most durable.
- Self-adjusting end hook for accurate butt-end and hook-over measurements.
- Available in 6 foot (W926D) and 8 foot (W928D) lengths.
- Packed in free "See Thru" re-usable box with hinged lid and snap fastener.



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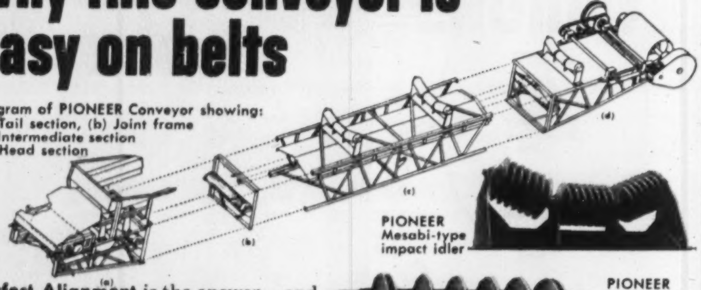
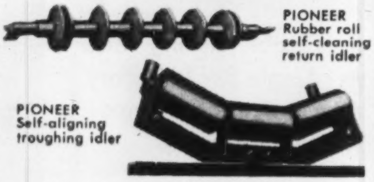
Why this conveyor is easy on belts

Diagram of PIONEER Conveyor showing:
(a) Tail section, (b) Joint frame
(c) Intermediate section
(d) Head section





Perfect Alignment is the answer...and far less belt replacement is the result.

First, PIONEER Continuflo Conveyors are jig-built at the factory, with joint frames between the sections to keep them straight and true.

Second, Head and tail pulleys are of large diameter to prevent belt slippage.

Third, Flexible rubber impact idlers absorb shock of falling materials, thus reducing cutting and wear of belt.

Fourth, Specially-designed self-aligning troughing idlers, in addition to forward tilt of regular idlers, hold belt in line.

Fifth, New-type self-cleaning rubber return idlers virtually eliminate build-up of abrasive materials on roller.

Sixth, Rollers and idlers turn easily. Antifriction bearings are used throughout. This also cuts power requirement.

Needs fewer support towers

Another outstanding feature of PIONEER Conveyors is their extra strength and rigidity. Angle iron construction, welded vertical and diagonal braces, and upper and lower chords tied together with lattice-frame construction make it possible to space support points as far apart as 40 feet.

It's easy to assemble PIONEER conveyors because no section is over 10' in length. Head and tail sections are specially built to meet your H.P. requirements. For details, write Pioneer Engineering Works, Inc., Minneapolis 13, Minn. (subsidiary of Poor & Company, Chicago).

Pioneer
Continuflo EQUIPMENT

delivery of the premises is to be construed as relating only to materials and workmanship. It was not a guarantee of the perfection of the plans and specifications. (MacKnight Flintic Stone Co. v. Mayor, 160 N. Y. 72, 86). The court in its opinion referred to many other cases to sustain this principle of law.

The court in its opinion stated: "It is immaterial whether the plans and specifications were originally prepared by the seller or by the buyer, as they were included in the contract of sale and the buyer thus agreed to accept a house constructed in accordance with such plans and specifications."

The court found as a fact that the building had been erected in accordance with the plans and specifications and that: "If the contracting parties had given thought to the condition of the soil, a watertight cellar could have been built in the first place, at very small additional expense. By the contract the defendant [seller] did not insure to the plaintiffs [buyers] a watertight cellar, or a watertight foundation even for a year. It agreed only to produce such a result as was possible with these plans and specifications by the use of adequate materials and by good workmanship."

An engineer who testified as an expert witness for the owner stated that the specifications for the foundations were inadequate for the site and that "construction in accordance therewith would not keep water out of the cellar."

The principle of law cited by the court in this case was established at times when it was the usual practice for a person to purchase a plot of ground and then retain an architect to prepare the necessary plans and specifications. Subsequently a contract was entered into with a builder to erect the house in accordance with those plans. He had to follow them, so the courts held that if his work was properly done and defects developed in the building, the builder was not responsible for them as he had no choice but to perform the work in accordance with the plans and specifications. In view of the fact that many houses now are being built by development companies who both design and build the house, it would seem equitable that this rule of law should be modified in such a manner as to make the seller live up to the guaranty.

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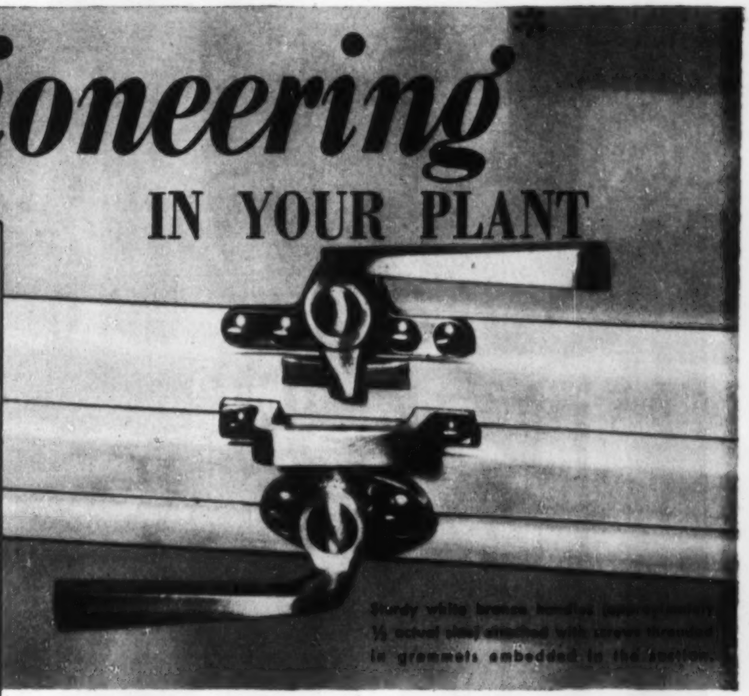
(1) Russ v. Lakeview Development Co., City Court of the City of New York, New York Law Journal, June 22, 1954.

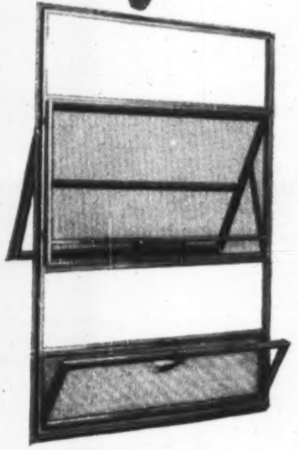
(These summaries of court decisions are prepared by J. Vernon Werbin, New York attorney and civil engineer.)

Visioneering

IN YOUR PLANT



Sturdy white bronze handles (approximately ½ actual size) attached with screws threaded in grommets embedded in the section.



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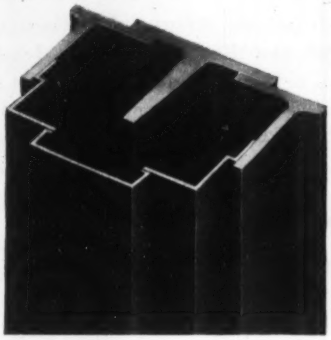

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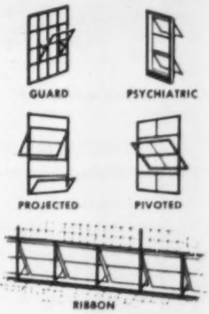

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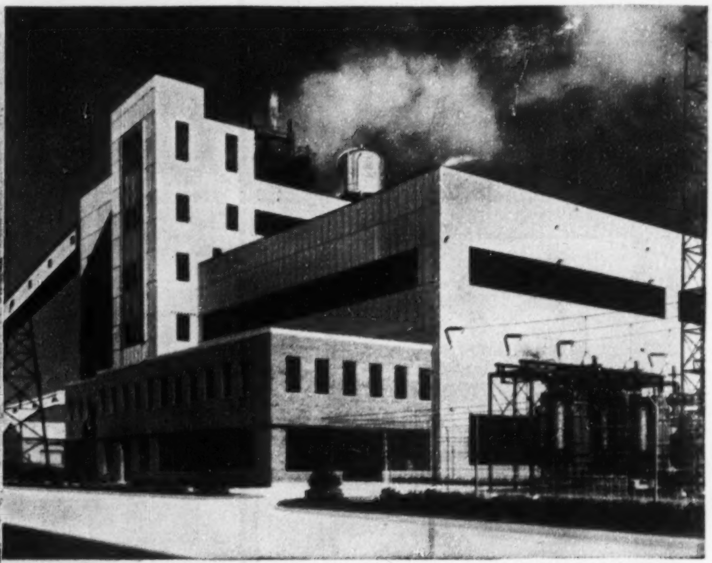
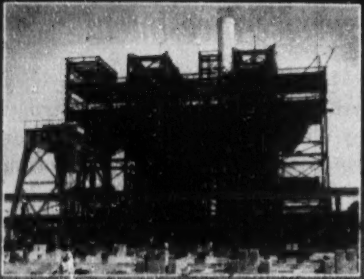
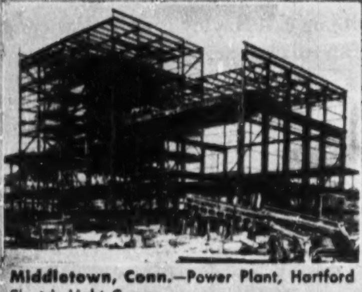


Newnan, Ga.
Plant Yates,
Georgia Power Company

Power to spare



Lumberton, N. C.—Power Plant, Carolina Power & Light Company



Middletown, Conn.—Power Plant, Hartford Electric Light Company

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **Mass., Falmouth**—HEATING PLANT—BA 9/10—U. S. Eng., 857 Commonwealth Ave., Boston, central heating plant, Otis Air Force Base, ENG-19-016-55-12. $250,000-$500,000. Plans deposit $10, refundable. Buerkel & Co., Inc., 24 Union Park St., Boston, engrs. CD 8/11.

▲ **MASSACHUSETTS** — BA 9/14 — Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Chelsea—Sect. I Contr. 1 Northeast Expressway. $4,900,000. Plans deposit $30, refundable. Extended date. Parsons, Brinckerhoff, Hall & Macdonald, 51 Cornhill St., Boston, engrs. CD 8/5.

BIDS ASKED—BUILDINGS

▲ **Vt., Montpelier**—HIGH SCHOOL—BA 9/10—City, Bd. Educ., Montpelier, high school. $1,000,000. Webber & Erickson, 56½ Merchants Row, Rutland, archts. CD 2/10.

▲ **Mass., West Springfield**—SCHOOL—BA 9/16—Town, High School Bldg. Comn., Town Hall, high school, Piper Rd., $2,900,000. Plans deposit $75. Extended date. Warren H. Ashley, 967 Farmington Ave., West Hartford, archt. Paul B. Johnson, 66 Vernon St., Springfield, assoc. archt. CD 8/17.

Conn., Hartford—SYNAGOGUE, etc.—Bids Asked—Blue Hills Synagogue, Inc., c/o Sidney Moses, 464 Farmington Ave., synagogue, Blue Hills Ave., corner Cornwall and Andover Sts. $300,000. Extended date. Adolph Feinberg, 1127 Main St., archt.

▲ **Mass., Newton**—WAREHOUSE—Bids Asked—Jordan Marsh Co., 450 Washington St., Boston, (selected list of bidders) 2 story, 440x770 ft., concrete, steel warehouse, 275 Grove St. $3,600,000. David Griswold, 80 South 7 St., Minneapolis, Minn., archt. CD 8/15/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Guerrera & Mancini, Rear 635 New Park Ave., Hartford, Conn., LB, **$207,471**, est. $200,000, sanitary and storm sewers, NEW BRITAIN, CONN. City, Bd. P. Wks., City Hall, New Britain, Conn. Bids Aug. 16. CD 8/6.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John A. Volpe Constr. Co.**, 54 Eastern Ave., Malden, Mass., CA, **$2,000,000**, MEDICAL CENTER and existing BOILER PLANT alterations, Arsenal St., PORTLAND, ME. Trustees of Maine Eye & Ear Infirmary, Maine General Hospital, Children's Hospital, 79 Bramhall St., Portland, Me. Bids Aug. 4. CD 7/27.

Swanburg Constr. Corp., Lumber Lane, Manchester, N. H. LB **$549,272**. Junior-Senior HIGH SCHOOL addn., Lindley St., EXETER, N. H. City, Raymond A. Hoyt, supt. Schools, Water St., Exeter, N. H. Bids Aug. 17. CD 6/30.

P. Madonia Co., 346 North St., Fitchburg, Mass. LB **$379,200**. HIGH SCHOOL, PETERBOROUGH, N. H. School Dist., H. LeGro Lane, chn. School Bd., Peterborough, N. H. Bids Aug. 16. CD 7/28.

G. L. Rugo & Sons, Inc., 80 Boylston St., Boston, Mass. CA **$845,189**, est. $825,000. Y-4-2 RECEPTION and DETENTION BLDG. Canterbury St., Dorchester, BOSTON, MASS. State, Youth Service Bd., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. CD 7/20, under LB.

The F. W. Brown Co., 25 Chestnut St., Norwich, Conn., LB, **$441,320**, SCHOOL, Franklin St., DANIELSON, CONN. St. James Parochial School, Franklin St., Danielson, Conn. Bids Aug. 16. CD 7/28.

▲ **Felix Buzzi & Son**, 612 S. Main St., Torrington, Conn., CA, **$1,168,500**, Regional Technical SCHOOL, Upper Birch St., adjacent to Knight Field, WILLIMANTIC, CONN. State, Ralph G. Macy, P. Wks. Comr., State Office Bldg., Hartford, Conn. Bids July 28. CD 8/3.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. Y., Astoria—BA 9/8—Dpt. P. Wks., Municipal Bldg. New York Zone 7, Contr. 4, structures and equip.; Contr. 5, electrical; Contr. 6, plumbing; Contr. 7, heating and ventilating for constr. Bowery Bay Sewage Treatment Works Exten. Berrian Blvd. and 43 St. Plans deposit $100. Extended date. CD 8/9.

New York—BA 9/13—The Power Authority of State of New York, 270 Broadway, Room 1207A, New York, Zone 7, fabrication, erection superstructure and floating supports of temporary steel truss, floating bridge connecting Hawkins Point to Barnhart Island over St. Lawrence River, near Massena, St. Lawrence Co., Spec. 5425-A, St. Lawrence Contract No. 2. Plans deposit $30. Praeger-Kavanagh, 126 E. 38 St., New York, engrs. adv. ENR 9/2. CD 3/18.

BIDS ASKED—BUILDINGS

▲ **N. Y., New York**—OUTPATIENT DPT. BLDG.—BA 9/8—Dpt. P. Wks., Municipal Bldg., Zone 7, Contr. 1, general constr.; Contr. 2, plumbing; Contr. 3, heating and ventilating; Contr. 4, electric work and lighting fixtures for constr. new out-patient department bldg., for Fordham Hospital, Crotona Ave. and Southern Blvd., Bronx Boro. Plans deposit $25. Extended date. CD 8/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1,

Brunner Asphalt & Constr., Inc., 237 Kensington Ave., Buffalo, N. Y., LB, **$557,981**, est. $564,000 1.38 mi. High Level Bridge Approaches, City of Buffalo, Fuhrmann Blvd., FAC 54-9, Erie Co.;

Daniel F. MacNamee & Co., Inc., New Rochelle, N. Y., LB, $569,716, est. $617,000 1.81 mi. New York State Thruway-Hudson Section-Sub 9A (Tappen Zee Bridge-Tarrytown Approach; Access Ramps and parking lot, H. T. 54-3, Westchester Co.;

H. L. Baughman, Inc., E. Henrietta Rd, Rochester, N. Y., LB, **$744,623**, est. $826,000 1.17 mi. Kitts Corners Naumburg, Pt. 2, FASSH 54-14, Lewis Co.;

Whiffen Electric Co., Inc., 84 Martine Ave., **Nager Electric Co., Inc.**, and **Port Chester Electrical Constr. Corp.**, 329 N. Main St., White Plains, N. Y., LB **$659,400**, est. $808,000 3.39 mi. New York State Thruway Hudson Section-Sub 9B (Tappen Zee Bridge and Approaches), H.T. 54-1 Rockland and Westchester Counties;

West Shore Concrete Co., Inc., & Garofano Constr. Co., Inc., Euclid Contg. Corp., 2 Gramantan Ave., Mount Vernon, N. Y., LB, **$3,623,480**, est. $4,080,000, 3 mi. New York State Thruway-Hudson Section-Sub 9B (Tappan Zee Bridge) H.T. 54-2, Rockland and Westchester Counties. Bids Aug. 19. CD 7/29.

Washbourne Constr. Corp., Plattsburg, N. Y., LB, **$335,605**. Locks 2, 3, 4, 5 and 6 (Barge Canal), US 87, Saratoga Co., NEW YORK, Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany 1, N. Y. Bids Aug. 19. CD 7/29.

▲ **NEW YORK**—Bureau of Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Johnson, Drake & Piper, Inc., 86 Trinity Pl., New York, 6, N. Y., LB, **$5,464,337**, est. $6,407,000. 6.35 mi. Thwy., 3.44 mi. Acc. Mi., Marginal roads A, B, C, N.Y.S. Thwy-Erie Section, Sub 5 (Route 20-Four Mile Level Rd) 4 misc. sec. Cross Rds. and Silver Creek-Forestville, SH 1469, C.T. 54-2, S.T. 54-3, R.C. 54-95, Chautauqua and Erie Counties;

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

D. W. Winkelman Co., Inc., Heffernans Bldg., Syracuse, N. Y., LB, **$3,323,476**, est. $4,637,000, 6.54 Thwy., 2.92 Acc. mi., N.Y.S. Thruway-Erie Sect., Sub 4 (Roberts Rd.-Route 20) 7 misc. cross Roads and Fredonia-Silver Creek Pt. 3A, SH 8038, E.T. 54-1, S.T. 54-2, R.C. 54-94, Chautauqua Co., CD 8/2;

Hendrickson Bros., Inc., 63 N. Central Ave., Valley Stream, N. Y., LB, **$933,723**, est. $1,137,000, 1.38 mi. Peninsula Blvd. Contract 3, Ocean Ave., FASS 54-13, Nassau Co.; LB, **$1,462,600**, est. $1,938,000, 1.16 Acc., 1.25 Hy. mi. Sunken Meadow Spur Parkway, Contract 4, Smithtown-Fort Salonga, Pt. 2, SH 1291, SMSP 54-2, RC. 54-87, Suffolk Co.;

White Oak Excavators, Inc., Plainville, Conn., LB, **$2,396,916**, est. $3,043,000. TSP 54-3; RC 54-93, Columbia Co.;

H. L. Baughman Inc., E. Henrietta Rd., Rochester, N. Y., LB, **$1,173,934**, est. $1,174,000, 0.30 acc., 0.32 hy. miles, City of Lockport-Genesee St.-Walnut St., FAC 54-10, Niagara Co.;

Arute Bros., Inc., 560 S. Main St., New Britain, Conn., LB, **$3,628,073**, est. $4,586,000, 7.08 mi. Elmira-Lowmann, SH 5207, Elmira-Horseheads Conn. Pt. 1 and 2, Elmira City; East Church St., Elmira-North Elmira Extension, Horseheads-Montour Falls, SH 5208, FASH 54-15, FAC 54-11, FARC 54-89, FASH-54-16, Chemung Co.;

Kendall Roadways, Inc., 1373 William St., Buffalo, N. Y., LB, **$228,007**, est. $232,000, 0.9 mi. Mile Strip Road, CR 460, Lake Shore-Lackawanna City, SH 5019, FASS 54-12, FARC 54-88, Erie Co.;

Hogeboom & Campfield, Inc., New Hartford, N. Y., LB, **$830,379**, est. $945,000. 4.44 mi. Fassett-Southport, SH 1561, FARC 54-86, Chemung Co.;

received no bids Aug. 19, 0.71 mi. Contract 1, Albany City; Riverfront Arterial Hy., FAC 54-8, Albany Co., est. **$1,297,000**; 0.33 mi. Fort Plin-St. Johnsville (CR65), FASS 54-14, Montgomery Co., Est. **$652,000**; (Hawthorne Traffic Circle) Taconic State Parkway, TSP 54-2, Westchester Co. Est. **$8,000**. Bids Aug. 19. CD 7/29.

Bero Constr. Corp., McKinley Bldg., Buffalo 2, N. Y., LB **$159,957**, est. $173,000. gas station-restaurant site New York State Thruway-Ontario Section, Subd. 6A and 6B (Leroy Gas Station-Restaurant Site, O.T. 54-4, Genesee and Montgomery Counties;

Warren Brothers Roads Co., 309 Basin St., Syracuse, N. Y., LB, **$178,417**, est. $204,000, (Clifton Springs gas station-restaurant site) New York State Thruway-Ontario Section-Sub. 15 O.T. 54-3, Ontario Co., NEW YORK, Bureau Contracts & Accounts, Dpt. P. Wks. The Governor Alfred E. Smith State Office Bldg., Albany 1, N. Y. Bids Aug. 19. CD 7/19.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

W. E. Graham, Cleveland, N. C. LB, **$1,259,280**, Contract M-485-10-320, Interchange, Washington National Pike and Baltimore & Ohio R.R. and Brown Station Road near Gaithersburg, Montgomery Co. Bids Aug. 17. CD 8/4.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

A. H. Smith, Branchville, Md., LB, **$446,290**. Contract HO-264-2-720, grading, drainage, wid'n. relocation, surf. 5.056 mi. State Route 175, Waterloo, Howard Co.;

Richard F. Kline, Box 665, Frederick, Md., LB, **$386,330** Contract M-528-3-320, grading, drainage, wid'n., relocation and surf. 3.717 mi. State Route 27, Damcus, Montgomery Co.;

Jas. Julian, Inc., 405 S. Dupont Rd., Elsmere, Del., LB, **$570,534**, Contract WO 332-2-120, grading, drainage, surf. 3.677 mi. U. S. 113, Basket Switch toward Berlin, Worcester Co. Bids Aug. 17. CD 8/4.

BUILDINGS

LOW BIDS AND CONTRACTS

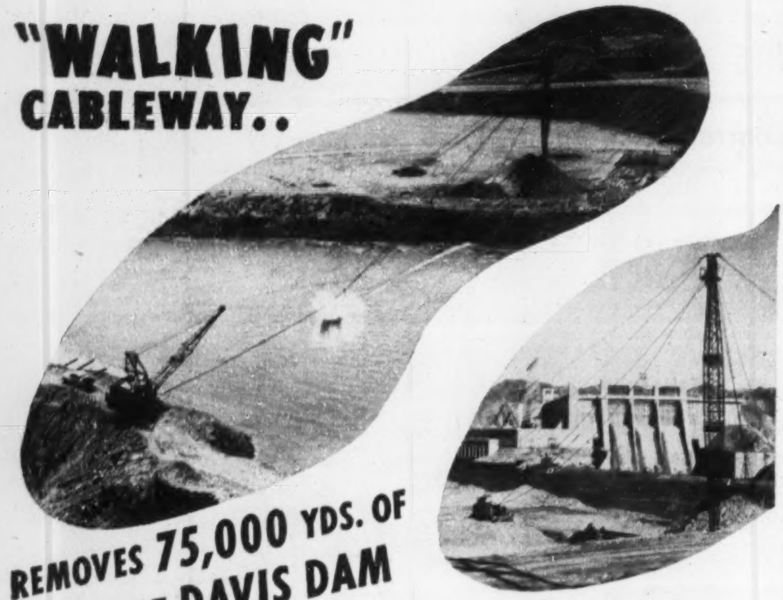
▲ **James Stewart & Co., Inc.**, 230 Park Ave., New York, N. Y., LB **$1,921,000**, general contract;

Tougher Heating & Plumbing Co., Inc., Menands, N. Y., LB, **$523,400**, heating work, for Dpt. Health, STATE OFFICE bldg., Holland Ave., ALBANY, N. Y. Bureau Contracts & Accounts, Dpt. P. Wks., The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids Aug. 19. CD 7/19.

▲ **John A. Johnson & Sons, Inc.**, 303 41 St., Brooklyn 32, N. Y. CA **$4,242,000**. foundations and general constr. for Coney Island HOUSES (Proj. NYC-25) in area bounded generally by Surf. Ave. W. 29 St. Boardwalk and W. 32 St., BROOKLYN, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. CD 8/11, under LB.

▲ **Taylor Park Homes**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y., Owner Builds, **$1,000,000**, 63 HOUSES on tract on Merritt Rd., south Hempstead Turnpike, FARMINGDALE, N. Y.

"WALKING" CABLEWAY..



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▲ **Hendrickson Bros.**, 63 N. Central Ave., Valley Stream, N. Y., CA Total cost **$25,000,000**, foundations for Edward F. Barrett Electric PLANT, ISLAND PARK, N. Y. Long Island Lighting Co., 250 Old Country Rd., Mineola, N. Y. Ebasco Services, 2 Rector St., New York, N. Y., engrs.

▲ **Alexander Muss & Jack Rappaport**, c/o Oscar Silverstone, archt., 153 Pierrepont St., Brooklyn 2, N. Y. Owner Builds, **$1,500,000**. two 6 story APARTMENTS for 196-families, 118 St. between Metropolitan Ave. and Lefferts Blvd., KEW GARDENS, N. Y.

Terminal Constr. Corp., 194 Hackensack Ave., Wood-Ridge, N. J., CA, **$700,000**, 11 story APARTMENT, to be called Frontenac Apartments, Hackensack and Prospect Sts., HACKENSACK, N. J. Prospect Assocs., Inc., c/o Kelly & Gruzen, archts., 80 Fifth Ave., New York 3, N. Y.

Stonehurst Manor Homes, c/o Garrett H. Felter, 76 County Rd., Tenafly, N. J. Owner Builds. **$900,000**. 45 HOUSES on tract near Woodland Park Dr. in East-hill Section, TENAFLY, N. J.

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York 17, N. Y., CA, **$8,500,000**. CATHEDRAL of the Assumption of the Blessed Virgin Mary. BALTIMORE, MD. Diocese of Maryland, Chancery Office, 408 N. Charles St., Baltimore, Md. Bids Aug. 18. CD 8/2.

▲ **Esco Co.**, Eig Bldg., Silver Spring, Md., Owner Builds, **$1,440,000**, 96 detached brick HOMES, in Northmont, SILVER SPRING, MD. J. D. 'Epagnier, 1004 Ripley St., Silver Spring, Md., archt.

▲ **Housing Corp. of America**, Cafritz Bldg., Wash., D. C., Owner Builds, **$1,500,000**, addnl. 150 frame HOMES between Connecticut Ave. and Vier Mill Rd., WHEATON, MD. J. D. 'Epagnier, 1004 Ripley St., Silver Spring, Md., archt.

▲ **Cafritz Constr. Co.**, 1404 K St. N.W., Wash., D. C., CA, **$1,250,000**, 121-unit 8 story, masonry APARTMENT, 2824 Connecticut Ave. N.W., WASH., D. C. Dr. Jacib Kotz, 1621 K St. N.W., Wash., D. C. Edwin Weihe, 1621 K St. N.W., Wash., D. C., archt.

▲ **E. I. du Pont de Nemours & Co., Inc.**, du Pont Bldg., Wilmington 98, Del., Own Forces. **$2,550,000**. LABORATORY BLDG., for electro-chemicals and pigments research, **WILMINGTON, DEL. CD 8/21/46.**

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

FLORIDA—BA 9/21—State Road Dpt., Tallahassee,

Glades Co.—heavy excav., rock base with bit. surf., 398 ft. concrete, steel bridge, other drainage structures 1.077 mi. State Road No. 25, bridge and approaches over Caloosahachee Canal at Moore Haven, F.-019-2 (4). $500,000. Plans deposit $25. R. T. Gupton, state hy. engr. CD 4/12.

BIDS ASKED—BUILDINGS

▲ **Va., Fairfax**—SCHOOL—BA 9/16—Fairfax Bd. Educ., Falls Church, Groveton High School. $1,500,000. Plans deposit $100. R. A. Willgoose, 300 Montgomery St., Alexandria, archt. CD 10/14.

▲ **Fla., Gainesville**—SCHOOL—BA 9/28—Alachua Co. Bd. Instruction, Gainesville, Gainesville High School. Over $1,000,000. Sanford W. Goin, Gainesville, archt. CD 11/25.

SOON LETS CONTRACT—BUILDINGS

▲ **Ala., Birmingham**—SHOPPING CENTER—U. S. Pipe & Foundry Co., 3300 First Ave. N., soon lets contract shopping center complete depts. for clothing, appliances and self service grocery. $1,000,000. Vau Keuren & Davis Co., 3004 7 Ave. S., archt. CD 2/16/53.

▲ **Va., Roanoke**—PLANT—General Electric Corp., River Rd., Schenectady, N. Y., soon lets contract, concrete frame plant, $6,000,000, J. E. Sirrine Co., 215 S. Main St., Greenville, S. C., engr. CD 3/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

VIRGINIA—State Hy. Dpt., 1221 E. Broad St., Richmond,

Adams Constr. Co., P.O. Box 60, Roanoke, Va., LB, **$88,029**, 7.13 mi. Route 701, State 1317-08, B.P.R. S-784 (1), Carroll Co.; LB **$78,042**, 3.17 mi. Route 625, State 1380-02, B.P.R. S-677 (1), Roanoke Co.;

Virginia Eng. Co., Inc., 80 29 St., Newport News, Va., LB, **$75,635**, 5.31 mi. on Route 640, State 1332-07, BPR S-758 (1), Fluvanna Co.;

Roanoke Paving Co., Roanoke, Va., LB, **$62,793**, 5.19 mi. Route 701, State 1315-12, BPR S-807 (1), Campbell Co.;

W. Wasing, Rockfish, Va., LB, **$63,583**, .61 mi. Route 30, State 4350-04-04, B.P.R. S-101 (3), King William Co.;

W. W. Tuck & Son, Virgilina, Va., LB, **$210,728**, 2.47 mi. Route 460, State 1909-17, BPR F-315 (18), Bedford Co.;

Mallard Constr. Co., Manassas, Va., LB, **$60,127**, 2.56 mi. Route 54, State 6142-03-04-95, B.P.R. S-SG-156 (3), Hanover Co. Bids Aug. 18. CD 8/5.

FLORIDA—State Road Dpt., Tallahassee,

W. L. Cobb Constr. Co., Box 977, Tampa, Fla., CA **$999,952**, grading roadway 13.213 mi. State Rds. 40 and 44, S.P. Job 7907-109, Volusia Co. Bids Aug. 10, awarded Aug. 19. CD 8/13, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Oman Constr. Co., Acklen Park, Nashville, Tenn. and **Codell Constr. Co.**, Winchester, Ky. LB **$674,713**. Contr. 4A consisting constr. 6 bridges of 3 and 4 span continuous rein.-con. beam constr., one bridge of single span simple rein.-con. beam constr. all supported by rein.-con. bents and abutments.

Ruby Constr. Co., Madisonville, Ky. LB **$683,542**. Constr. 4B consists of constr. one five-span built-up steel girder bridge (Bridge A-7) supported by rein-

(Continued on page 96)

MANITOWOC 2000

...money making master of many jobs!

Converts to 1¼ yard trench hoe with digging depth of 25'-6"

Get the greatest return from your equipment dollar — put a versatile Manitowoc on the job — and watch it pay off on *every* job *every* day of the year . . .

. . . as a husky 1¼ yard shovel, you get fast cycles, more power at the dipper and the efficiency and economy of only 13 working gears.

. . . as a fast, low ground pressure 1¼ yard dragline with dragline speeds of 183 F.P.M., pull of 20,400 lbs. and hoist line speed of 194 F.P.M.

. . . as a 25-ton crane, you get maximum safety and accuracy, full 25-ton capacity at 12 foot radius, high lift of 100 ft. and full operator vision in 3 directions.

. . . as a fast-operating 1¼ yard clamshell, the "2000" features a long reach, high lift and smooth yardage-producing operation.

Before you buy — get all the facts on the "2000" and find out why the big swing all over the nation is to mighty Manitowoc. Write Manitowoc Engineering Corp., Manitowoc, Wisconsin.

MANITOWOC

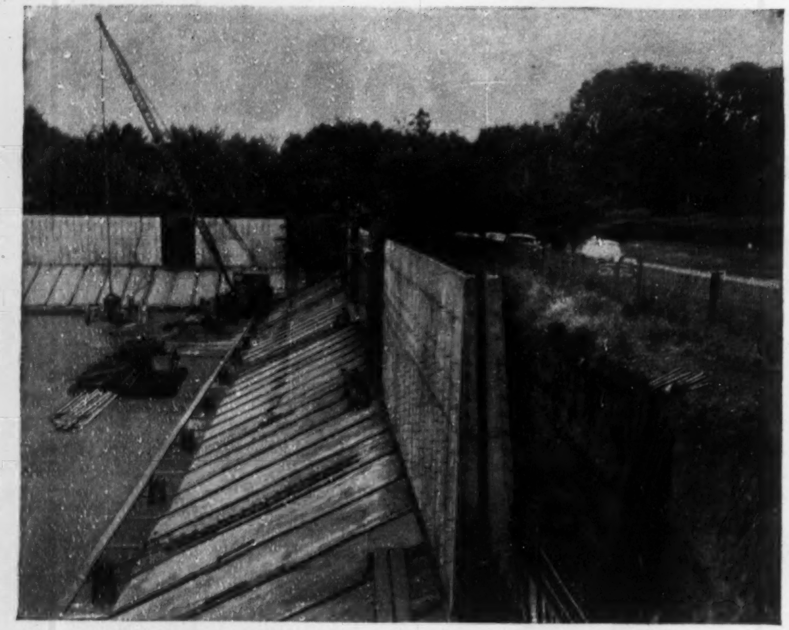
SHOVELS
1-5 YD.

Speedcrane

CRANES
18-100 TON

the Torque Converter makes the difference

- **PRECISE CONTROL** — "Fraction of an inch" control by either hand throttle or foot accelerator, without slipping clutches.
- **SMOOTHER OPERATION**—Cushion of oil absorbs jarring impacts which saves cables, clutches and machine assemblies.
- **BALANCED POWER-LOAD** — Engine operates at maximum efficiency at all times . . . full engine power under full load, just enough power for light loads . . . assuring economy of operation. Engine cannot stall and develops full "lugging" power. Load requirements and engine horsepower always automatically balanced.
- **INFINITE SPEEDS** — No gears, but all the advantages and none of the disadvantages of automatic, multi-speed transmissions. An infinite number of speeds at your command without shifting, since speeds and power are automatically balanced at all times.



Water Reservoir, Omaha, Nebraska—De Buse Bros., Form Erectors

Symons Forms for Battered Walls

Battered walls are constructed similar to vertical walls, the only difference being a variation in tie lengths. Ties are placed when inside form is erected . . . outside wall is locked to ties with the same connecting bolts and wedges that bind panels together.

Send plans for your next job and get complete layout and cost sheet—no obligation. Symons Clamp & Mfg. Co., 4265-14 Diversey Avenue, Chicago 39, Illinois.

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Roller Gate Controllable Discharge Buckets for normal or low slump concrete for general construction work; CAC Buckets with air-operated clam gates for low slump mass concrete specifications; Type C Manual Clam Gate Buckets for normal slump concrete.

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F. H. McGraw & Co.

BLAW-KNOX

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PA.
Offices in Principal Cities

(Continued from page 94)

con. piers and abutments; LB **$1,227,034**. Contr. 4 (Combination Contrs. 4A and 4B). Bids Aug. 20. CD 8/3.

▲ **Roy Ryan & Sons,** 800 E. Michigan St., Evansville, Ind. CA **$1,038,617.** addns., imprvs. to water and sewerage sys., HENDERSON, KY. City, Henderson, Ky. Bids July 29, awarded Aug. 13. CD 8/3, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Heury C. Beck Co.,** First National Bank Bldg., Atlanta, Ga., CA, **$2,500,000,** OFFICE, ATLANTA, GA. Retail Credit Co., Fairlie St. N.W., Atlanta, Ga.

▲ **A. R. Briggs Constr. Co.,** 526 Arch St., Macon, Ga., CA, **$2,000,000** OFFICE, MACON, GA. Insurance Co. of North America, 1021 Georgia Ave., Macon, Ga.

▲ **Jerome Constr. Co.,** 14 N. Abercorn St., Savannah, Ga., CA, **$1,200,000,** 175 RESIDENCES, SAVANNAH, GA. C. & W. Co., Waters Rd., Savannah, Ga.

▲ **Hugh Edwards,** Gainesville, Fla., Force Account, **$4,000,000,** 500 RESIDENCES, GAINESVILLE, FLA.

▲ **Jack Culpepper, 114 E. 5 Ave., Tallahassee, Fla.,** CA, **$1,695,156,** STATE OFFICE, TALLAHASSEE, FLA. State Imprvt. Comn., Caldwell Bldg., Tallahassee, Fla. Bids Aug. 5. CD 6/30.

▲ **Berg & Diehl, Inc.,** Annex, First National Bank Bldg., Mobile, Ala., Force Account. **$1,500,000.** 130 RESIDENCES, MOBILE, ALA.

▲ **Goode Constr. Corp.,** P.O. Box 666, Charlotte, N. C., CA, Est. **$1,250,000,** OFFICE, MOBILE, ALA. Mobile Medical Arts Bldg., Inc., Cox St., Mobile, Ala. Louis H. Asbury & Son, 121 Brevard Court, Charlotte, N. C., archts.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Illinois**—BA 9/15—U. S. Eng., 420 Locust St., St. Louis 2, Mo., pressure relief wells and collector sys., East St. Louis and vicinity, (East Side Levee and Sanitary District), Proj. I em V-A (2), Parts and 2, Madison and St. Clair Counties, CIVENG-23-065-54-127. CD 7/28, under LB.

BIDS ASKED—BUILDINGS

O., **Athens**—DORMITORY—BA 9/14—Ohio University, Athens, 4 story, brick, rein.-con., Dormitory No. 6. $765,000. Plans deposit $25. Potter, Tyler, Martin & Roth, 128 E. 6 St., Cincinnati, engrs. CD 7/21.

Ill., **Decatur**—CHURCH, etc.—BA 9/16—Westminster Presbyterian Church, Dr. R. Cruthers, pastor, Decatur, 3 story, steel, rein.-con., masonry church educational bldg., incl. extensive alterations to existing bldg. $300,000. P. John Hoener & Assocs., 4227 Watson Rd., St. Louis 9, Mo., archts.

Mich., **Trenton**—WAREHOUSE—Bids Asked—Monsanto Chemical Co., 827 Fisher Bldg., Detroit, warehouse, West Jefferson St.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **George Sheaf & Co.,** 449 Neilston St. and **Christopher Constr. Co.,** 8 E. Broad St., Columbus, O. CA **$1,911,937.** Jackson Pike Sewage Treatment Plant, COLUMBUS, O. City, City Hall, Columbus, O. CD 6/3, under LB.

▲ **Santucci Constr. Co.,** Skokie, Ill., LB, **$2,408,000,** sewerage system;

Clark Constr. Co., Owensboro, Ky., LB, **$1,169,700** sewage treatment plant, CONNERSVILLE, IND. Bd. P. Wks. City Hall, Connersville, Ind. Bids Aug. 16. CD 5/10.

▲ **Standard Paving Co.,** 30 N. La Salle St., Chicago 2, Ill., CA, **$1,600,000,** lower level parking, Michigan Ave. and Wacker Dr., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids July 9, awarded Aug. 12. CD **6/30.**

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

L. A. Davidson Co., 213 St. Joseph St., Lansing, Mich., LB, **$4,558,729,** est. $4,700,000. c. conc. with curb, gutter; John C. Lodge Expressway from Pilgrim Ave. to alley west of Dexter Ave. and from Chicago Blvd. to near west Grand Blvd. BUI 82-128 C11 BUI 83-128 C12 (BUI 404-84), Detroit, Wayne Co.; LB **$928,128,** est. $960,000, grading 0.224 mi. M20 Water to Linn Sts., and water main from 7 and Water St. to near Linn St., Bay City, Bay Co. CD 8/5;

Harry Pickitt, Allegan, Mich., LB, **$67,511,** est. $100,000 road base connection and aggregate surface course 5.37 mi. FAS Rte. 259, CS 81-49-C 11 (S 202-2), Bridgewater-Saline, Washtenaw Co.;

Julius Porath & Son, UPW Transportation Bldg., Detroit, Mich., LB, **$293,332,** est. $340,000. c. conc. 1.84 mi. Beech Rd. CS 82-184 C 4 (S-108 9) Wayne Co.;

Lewis & Frisinger, Ann Arbor, Mich., LB, **$61,998,** est. $70,000. aggregate surface course 1.586 mi. on grounds of Northville State Hospital, Northville, Wayne Co. CD 8/12;

A. & A. Asphalt Paving Co., 1045 Haynes St., Birmingham, Mich., LB, **$152,108.** est. $190,000, base correction and b. conc. 4.965 mi. 12-Mile Road. Novi, Oakland Co., CS 63-92-C 2 (S-643-4), Oakland Co. Bids Aug. 18.

A. J. Smith Contg. Co., 21400 W. Eight Mile Rd., Detroit, Mich. CA **$384,050.** 6 mi. 6 and 8 in. c. conc., FLINT, MICH. City, Harry K. Cull, city clk., Flint, Mich. Bids July 8.

A. J. Smith Contg. Co., 21400 W. Eight Mile Rd., Detroit, Mich. CA **$338,400.** 4.8 mi. 6 and 8 in. c. conc., FLINT, MICH. City, Harry K. Cull, city clk., Flint, Mich. Bids July 26.

(Continued on page 98)

Low Cost and Lowest Maintenance . . . in Bridge Railing and Light Standards

Bay St. Louis Bridge (Bay St. Louis to Henderson Point, Mississippi)

More and more bridge installations attest the low-cost, maintenance-free advantages of rustproof aluminum — and the superiority of this metal in modern design.

Single rails of four-inch Reynolds Aluminum pipe on each side of this three-mile bridge are mounted on cast aluminum posts. Conduit racks are three-inch Reynolds Aluminum channels with ¾-inch rod used for hanger bolts. All of these are standard Reynolds Aluminum mill products. The aluminum light standards are commercially manufactured. For sources of such immediately available products and for advice on special aluminum requirements, call the nearest Reynolds Office listed under "Aluminum" in classified directories.

Or write to **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

Reynolds Aluminum Railing, Light Standards and Electrical Conduit Racks

Railing Fabricators: Southwest Ornamental Iron Works, Kansas City, Mo.

Light Standard Manufacturer: Union Metal Company, Canton, Ohio.

Electrical Contractor: Power Electric Co., Jackson, Miss.

For quick reference, see catalog $\frac{5a}{Re}$ in Sweet's Architectural File.

REYNOLDS ALUMINUM

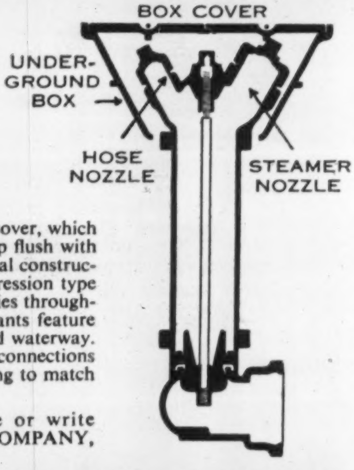
SEE "MISTER PEEPERS," starring Wally Cox, Sundays, NBC-TV Network.

MH
FLUSH TYPE HYDRANTS FOR AIRPORTS

This M & H Hydrant sets completely underground. The cast iron box cover is on line with the ground level, thus completely eliminating any interference with traffic. M & H flush type hydrants are especially designed for use at airports servicing the heaviest modern airplanes.

The operating nut and nozzles are accessible simply by lifting the two piece cover, which has disappearing handles designed to drop flush with the cover when not in use. Hydrant internal construction is exactly the same as M & H compression type fire hydrants used by so many municipalities throughout the country. M & H flush type hydrants feature a 5¼" valve opening and an unobstructed waterway. Can be supplied with one or two fire hose connections and/or with steamer nozzle, with threading to match existing standards.

For additional information, wire or write M & H VALVE AND FITTINGS COMPANY, ANNISTON, ALABAMA.



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E. J. Longyear CO
MINNEAPOLIS
NEW YORK CITY SALT LAKE CITY

(Continued from page 96)

BUILDINGS

LOW BIDS AND CONTRACTS

John G. Ruhlin Constr. Co., 1024 Home St., Akron, O. CA **$620,256**. general contract ARTS AND SCIENCES BLDG., Brown St. and Buchtel Ave. on campus, AKRON, O. Bd. Directors, University of Akron, Buchtel Ave., Akron, O. Bids July 29, awarded Aug. 16. CD 8/20, under LB.

▲ **Shelby Constr. Co., Inc.**, 1108 Canal St., New Orleans, La., CA, Est. **$5,000,000**. 19 story, 260,000 sq. ft. all-aluminum siding OFFICE, 100-car parking in bsmnt., Third and Broad Sts., in downtown COLUMBUS, O. Chipley Realty Co., 720 E. Broad St., Columbus, O. Richard Roth of Emery Roth & Sons, 575 Madison Ave., New York, N. Y., archt.

▲ **B & B Constr. Co.**, 641 Himrod Ave., Youngstown, O. LB Est. **$1,000,000**. addns. to West and East Junior high SCHOOLS, WARREN, O. Bd. Educ., Warren, O. CD 11/6.

▲ **W. K. Kerr**, 42 E. Gay St., Columbus, O. CA Est. **$1,500,000**. 132 HOMES in Merriman's Second addn., WEST JEFFERSON, O. John W. Galbreath & Co., Inc., 42 E. Gay St., Columbus, O.

John C. Rader, Danville, Ind., Owner Builds, **$350,000**, HOMES in northern part of DANVILLE, IND.

Simpson & Co., Greenwood, Ind. Owner Builds, **$400,000**, HOMES, GREENWOOD, IND.

▲ **Shelby Constr. Co.**, 1108 Canal St., New Orleans, La., Owner Builds, **$1,500,000**, HOMES in East 42 St. area, INDIANAPOLIS, IND.

Ed Martin Realty Co., New Augusta, Ind., Owner Builds, **$350,000**, HOMES in north addition, NEW AUGUSTA, IND.

Sorensen-Gross Co., Flint, Mich. CA, **$303,593**, est. $315,000. ADMINISTRATION BLDG., Beach and Fifth Sts., FLINT, MICH. Bd. Supervs. Genesee Co., 211 W. Oakley St., Flint, Mich. Bids Aug. 6. CD 7/22.

Champion, Inc., P.O. Box 231, Iron Mountain, Mich. CA, **$457,609**. POWER STATION to house generating facilities, GLADSTONE, MICH. City, Municipal Light Dpt., Gladstone, Mich. Bids Aug. 4. CD 7/8.

▲ **A. W. Kutsche & Co.**, 6275 Schaefer St., Dearborn, Mich. CA, **$1,029,500**. 5 story RESIDENCE HALL for Girls, Michigan State Normal College, YPSILANTI, MICH. State, A. N. Langius, dir., State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Bids Aug. 3. CD 7/22.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Minn., Minneapolis**—PRESSURE GROUTING—BA 9/8—U. S. Eng., 1709 Jackson St., Omaha, Neb., pressure grouting of floor slabs at blank cartridge bldg., Twin Cities Arsenal, Inv. 25-066-55-23. CD 5/14/53, under Public Buildings.

† **South Dakota**—BA 9/8—U. S. Eng., 1709 Jackson St., Omaha, Neb., roadway, parking area, bumper guard, for Cold Brook Dam, near Hot Springs, Inv. 25-066-55-16. CD 7/28, under LB.

† **Tex., Del Rio**—POST EXCHANGE, etc.—BA 9/8—U. S. Eng., Box 1229, Galveston, post exchange, auditorium-theatre and cold storage addn., Laughlin Air Force Base. Over $100,000. Extended date. CD 7/28.

† **Neb., Lincoln**—TAXIWAY—BA 9/14—U. S. Eng., 1709 Jackson St., Omaha, Neb., A-3 taxiway at Lincoln Air Force Base, Inv. 25-066-55-20. CD 8/5.

† **Wyoming**—BA 9/14—Bureau Reclamation, Dpt. Interior, Reclamation Center, Casper, earthwork, buried asphaltic membrane lining, Casper Canal Station 819 plus 00 to Station 838 plus 50 and Station 854 plus 48.5, to Station 861 plus 98.3, Kendrick Proj., Spec. 703C-352; adv. ENR 9/2.

† **South Dakota**—BA 9/16—U. S. Eng., 1709 Jackson St., Omaha, Neb., diesel-generator standby set for Gavins Point Reservoir Proj., near Yankton, Inv. 25-066-55-17.

▲† **Missouri**—BA 9/29—U. S. Eng., P.O. Box 867, Little Rock, Ark., two hydraulic turbines and accessories, Table Rock Dam, Branson, Taney Co., Serial No. CIVENG-03-050-55-10, incl. two 68,000 h.p. hydraulic turbines, draft tube pier Nosings for four (correct) turbines, draft tube liner anchorages, spiral case, spiral case extension, stay ring, pit liner, misc. embedded items for two turbines, turbines to power two 50,000 kw. generators, eventually two more turbines, generators, $1,000,000-$3,000,000. CD 7/21.

† **Tex., Victoria**—POST EXCHANGE—BA 9/30—U. S. Eng., P. O. Box 1229, Galveston, post exchange, 350-man theater and dental clinic, modification, Foster Air Force Base, ENG-41-243-55-13. $100,000-$550,000. Extended date. CD 8/18.

BIDS ASKED—BUILDINGS

Mo., St. Louis — INDUSTRIAL AND OCCUPATIONAL THERAPY—BA 9/7—State, Division P. Bldgs., Ralph McSweeney, dir., 100 State Capitol, Jefferson City, 2 story, 110x112 ft. brick, rein.-con., industrial and occupational therapy bldg. St. Louis State Hospital, 5400 Arsenal St. $500,000. Plans deposit $25, Rathmann, Koelle & Carroll, 316 N. 8 St., Zone 1, archts. CD 3/2/53.

▲ **Minn., Northfield**—LIBRARY—BA 9/8—Carleton College, L. M. Gould, pres., library, $1,300,000. Magney, Tusler & Setter, 202 Foshay Tower, Minneapolis, archts. CD 3/15/51.

† **Mo., St. Louis**—BUILDING—BA 9/9—U. S. Eng., 601 Davidson Bldg., Kansas City 6, Mo., rehabilitation, modification Bldg. No. 111, St. Louis Ordnance Plant, incl. furnishing, installation boilers, coal and fly ash handling equip. CD 8/10.

(Continued on page 100)

TODAY'S FAST-MOVING CONSTRUCTION JOBS call for nimble haulers like this new GMC M470 — shown here equipped with a 5-yard Heil dump body. Its 145 horsepower comes from GMC's famed "302" engine — pound for pound the mightiest in gasoline truck history. And its extra hustle's due to the timesaving abilities of the world's first 8-speed Hydra-Matic Drive. Little wonder it's a top choice on any job calling for dependable 22,000 GVW hauling.

You make shorter work of any job with Hydra-Matic* GMC's

THERE'S no mystery about it. These great new GMC's simply step up your pace on those time-killing routines that slow down any job using ordinary trucks.

Take the incessant stop-and-go — the slow-motion maneuvering on the job-site.

Hydra-Matic's full-torque self-shifting eliminates the lag at every gear-change — avoids all those momentum losses. Every start — every pickup in speed — is quicker. That alone's a healthy timesaver.

Hill-climbing goes at a smarter clip. For these GMC's deliver full pulling power *automatically* — and top the toughest grade without a break in stride.

And you save more than time. There's no conventional clutch to go bad — or even need minor adjustment. Axle and drive line can't be damaged by shock-loading. Brakes and tires last longer. In fact, all maintenance needs — and maintenance costs — are less.

Keeps Drivers on the Beam

A Hydra-Matic GMC makes things as easy for the driver as for itself. He avoids all that clutch-pedal hopping — those hundreds of daily fights through a gearbox. Less tired — more alert — he's bound to do a better job.

Take a minute to add in other Hydra-Matic advantages like better gas mileage — longer truck life. Then see your GMC dealer and find out how soon you can have these timesaving — *and moneysaving* — trucks working for you!

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TRUCKS

Be careful — drive safely

*Hydra-Matic standard on many models; optional at extra cost on some others

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BROS *tip sheet*

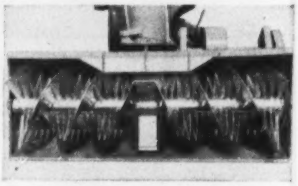
EQUIPMENT NEWS FROM A FAMOUS NAME IN ROAD MACHINERY

POWERFUL NEW TRACTOR-MOUNTED ROTARY FOR "SMALL BUDGET" SNOW REMOVAL

In the fall, detach the bucket from the hydraulic front-end loader. Attach the Series "A" plow and engine unit. In the spring, just remove this unit and re-attach the bucket, leaving your tractor loader free for summer work.

Imagine a powerful rotary snow plow costing less than one good shoveler's pay for six months! This Bros Series "A" Sno-Flyr does the work of dozens of hand shovelers at a fraction of the cost. And you can reckon your removal time in minutes and hours instead of days! If you want fast snow removal but cannot justify larger truck rotaries, this Series "A" is for you!

Two special casting chute attachments are available for the Series "A" Sno-Flyr. A segmented "finger-joint" chute capper permits you to adjust height of snow stream, just like crooking your finger. A longer loading chute is also available for truck hauling work. The Series "A" is offered in three plowing widths—4′4″, 5′6″ and 6′6″.



Terrific Series "A" performance is due largely to the slit-spiral rotor's unique slots which "knife" through hard-packed snow, handling it easily.

This "A" Rotary features the famous Bros 180° revolving ball-bearing casting chute with cab-mounted hand control.

THIS LOW-COST PLOW NOW AVAILABLE FOR JEEPS

This year Bros is also offering an adaptation of the Series "A" which mounts on 4-wheel drive Jeeps. This model of the Sno-Flyr Rotary is an ideal width (6′6″) for most custom-plowing work. Makes a blade-plow Jeep a tool of yesterday.

"Quickies" for your information

Bros also makes the world-famous line of Series "M" Sno-Flyr Rotaries for large 4-wheel drive trucks, motor graders and crawler tractors.

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Also new from Bros last year were two new smaller self-powered Sno-Flyr Rotaries, Series "SA", 21″ and 26″ plowing widths.

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Early spring of 1954 Bros delivered the largest railroad rotary ever built. Moral: if you want to plow snow, call Bros!

Road Machinery Division... **WM. BROS BOILER AND MFG. CO.**
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To get specifications and data on any of the Bros snow removal products listed below, just check the items which interest you and send us this slip, along with your name, company or organization and postal address.

- ☐ Series "A" Sno-Flyr Rotaries for tractor loaders
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- ☐ Series "M" Sno-Flyr Rotaries for 4-wheel drive trucks
- ☐ Bros blade-type push plows
- ☐ Series "M" Sno-Flyr Rotaries for motor graders
- ☐ Series "M" Sno-Flyr Rotaries for crawler tractors

(Continued from page 98)

▲ **Tex., El Paso**—SCHOOL—BA 9/9—Bd. Trustees Independent School Dist. of El Paso, constr. Wm. H. Burges Independent High School, Over $1,000,000. Plans deposit $100. Davis & Foster, Mills Bldg., archts.-engrs. CD 8/20.

▲ **Tex., Orange**—HOSPITAL—BA 9/9—Orange Co., Orange, 5 story, part bsmnt., 85,000 sq. ft. 160-bed brick, rein.-con. hospital. $2,500,000. Plans deposit $50. Golemon & Rolfe, 5102 Travis St., Houston, archts. Bernard Johnson & Assocs., 4926 Travis St., and Walter P. Moore, 2 Pinedale St., Houston, engrs. CD 12/14.

Minn., Alexandria—HOSPITAL—BA 9/15—Douglas Co., P. L. Hintzen, aud., 1 story, part bsmnt., main section 65x185 ft. county hospital with four 43x73 ft. wings. $800,000. Plans deposit $25. F. Jackson & Assocs., St. Cloud, archts. CD 1/7.

▲ **Minn., Hibbing**—HOSPITAL—BA 9/15—Bd. Trustees General Hospital Expansion Fund, C. Campbell, secy., 95-bed hospital addn., remodeling existing bldg. Over $1,000,000. Plans deposit $25. Jyring & Jurenes, Hibbing, archts. CD 8/11.

▲ **Minn., Duluth**—STUDENT CENTER—BA 9/22—Regents of University of Minnesota, 404 Administration Bldg., Minneapolis, student center, $887,000, dormitories, $240,000, Duluth Branch. Plans deposit $25. A. R. Melander, 603 Alworth Bldg., archt. W. A. Close, University of Minnesota, advisory archt. CD 12/31/52.

▲ **Minn., Fairmont**—SCHOOL—BA 9/23—Bd. Educ., M. Beach, clk., high school. $1,000,000. Plans deposit $50. Hills, Gilbertson & Hayes, 6009 Wayzata Blvd., archts. CD 10/15.

SOON LETS CONTRACT—BUILDINGS

▲ **Tex., Houston**—SHOPPING CENTER—Gulfgate Shopping Center, Theodore W. Berenson & Assoc., 50 Federal St., Boston, Mass., and c/o Ben McGuire, Bankers Mortgage Bldg., soon lets contract 3 story, bsmnt. shopping center unit, Joske's & Co., $2,500,000; constr. superstructure only of main bldg. shopping center, $4,500,000; 5,000-auto parking center, $350,000. Irving R. Klein & Assocs, 1317 Austin St., Houston, Tex., and John Graham & Co., 1326 Fifth Ave., Seattle, Wash., archts.-engrs. CD 8/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Grove City Surfacing Co., Grove City, Minn. CA, **$249,026.** grading 9 mi. between Cut Foot Sioux and Squaw Lake, Itasca Co.

J. Dieseth Co., P.O. Box 97, Fergus Falls, Minn. CA, **$298,538.** soil cement base, plant-mixed bit. surf. 10.5 mi. between Amboy and Mapleton, Blue Earth Co. Bids July 23. CD 7/9.

KANSAS—State Hy. Comn., Olathe,

Henery Constr. Co., Ottawa, Kan. LB, **$250,046.** grading 10 mi. from State Line to New US 50, near Olathe, Johnson Co. Bids Aug. 13. CD 7/30.

Reno Constr. Co., Hickman Mills, Mo. LB, **$242,354.** paving 8 mi. Prairie Center Rd. between Olathe and Sunflower Ordnance Works, near OLATHE, KAN. Johnson Co., Court House, Olathe, Kan. Malcolm M. Steele, c/o engr. Bids Aug. 6.

▲ **TEXAS**—State Hy. Comn., Austin,

Olene Hanson, 4906 Griggs Rd., Houston, Tex., LB, **$103,278,** 11.762 mi. Proj. S 1879 (1) etc., Brazos Co.;

Foley & Williams Contractors, 243 Owen Bldg., Tyler, Tex., LB, **$68,618,** 4.529 mi. Proj. R 1574-2-2, Cass Co.;

Dew Constr. Co., P.O. Box 641, Tyler, Tex., LB, $818,762 6.721 mi. Proj. FI-526 (11), Dallas Co.;

Texas Bitulithic Co., P.O. Box 10365, Dallas, Tex., LB, **$151,827,** 3.386 mi. Proj. U 515 (21), Dallas Co.;

J. R. Canion, P.O. Box 756, Austin, Tex., LB, **$92,564** 5.775 mi. Proj. 1325-3-1, Freestone Co.;

Austin Bridge Co., P.O. Box 1590, Dallas, Tex., LB, **$201,967,** 0.899 mi. Proj. F 539 (140), Grayson Co.;

Constructors, Inc., P.O. Box 18013, Houston, Tex., LB, **$179,887** 0.42 mi. Proj. C-500-3-44, Harris Co.;

F. C. Herrling, Kurten, Tex., LB, **$174,307,** 10.328 mi. Proj. R 1723-1-1, Madison Co.;

J. W. Perry, 501 Ins. Bldg., San Antonio, Tex., LB, **$78,453,** 9.441 mi. Proj. R 1814-2-1, etc., Maverick Co.;

H. B. Zachry Co., P.O. Box 2570, San Antonio, Tex., LB. **$476.100.** 11.592 mi. Proj. S 213 (2) Nolan Co.;

Cage Brothers, 6959 San Pedro St., San Antonio, Tex., LB, **$310,776,** 19.242 mi. Proj. C 102-2-15, etc., Nueces Co.;

Ivan Dement, Inc., P.O. Box 1787, Amarillo, Tex , LB, **$125,232,** 11.46 mi. Proj. R 308-5-2, etc., Ochiltree Co.;

Schwope Bros., 6633 W. Commerce St., San Antonio, Tex., LB, **$132,074,** 3.892 mi. Proj. F 1049 (5), etc., Orange Co.;

J. O. Boswell, 311 Parish Ave., Lubbock, Tex , LB, **$182,959,** 19.199 mi. Proj. S 1050 (6) etc., Swisher Co.;

W. L. Barnes, 3102 Perry Lane, San Antonio, Tex., LB, **$99,306,** 9.612 mi. Proj. S 1611 (2), etc., Taylor and Callahan Counties;

R. C. Buckner, P.O. Box 609, Jacksonville, Tex., LB, **$102,029,** 5.6 mi. Proj. S 1755 (2), Tyler Co.;

Collins Constr. Co. of Texas, P.O. Box 1192, Austin, Tex., LB, **$185,532,** 6.259 mi. Proj. C 315-7-3, Washington Co.;

South Texas Constr. Co., P.O. Box 3536, Corpus Christi, Tex., LB, **$146,571,** 5.626 mi. Proj. S 1872 (1), Wharton Co.;

Charles B. Jones, Route 1, Boyd, Tex., LB, **$418,123,** 10.782 mi. Proj. F-105 (2), etc., Wood and Smith Counties;

Reynolds & Huff, P.O. Box 88, Tyler, Tex., LB, **$138,769,** 8.762 mi. Proj. C 1936-1-1, Wood Co. Bids Aug. 17. CD 8/2, 7/27.

(Continued on page 103)

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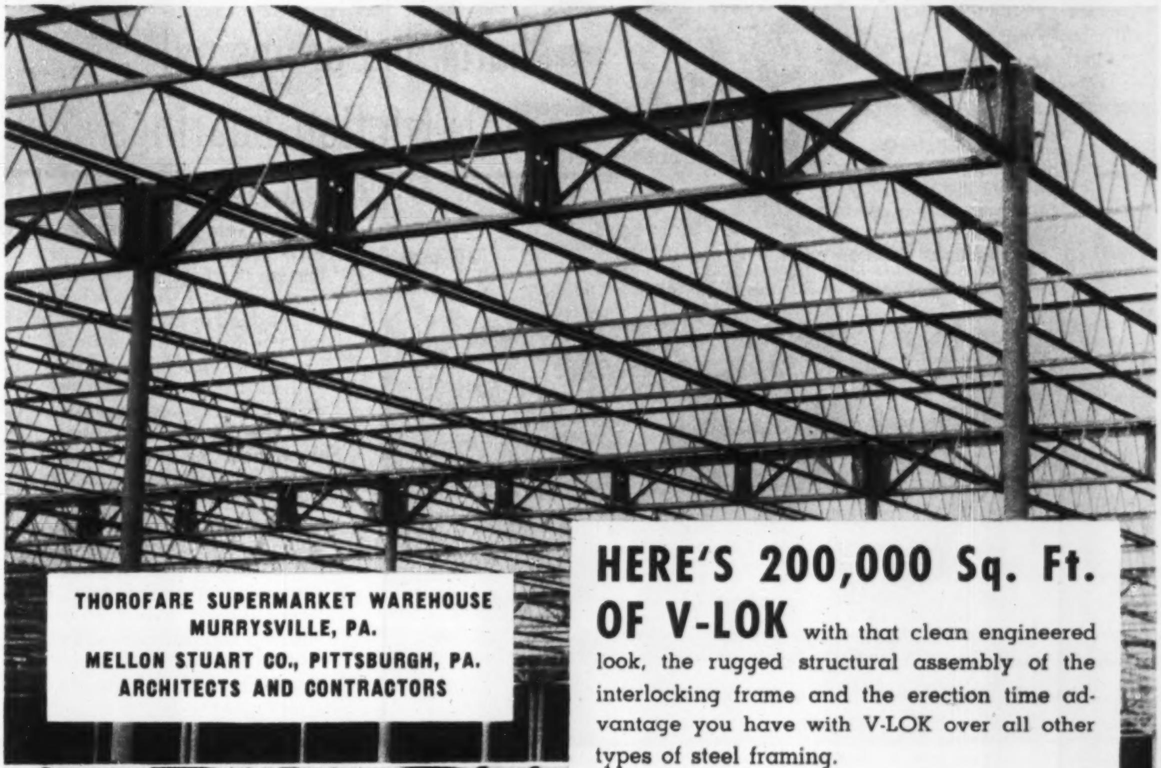

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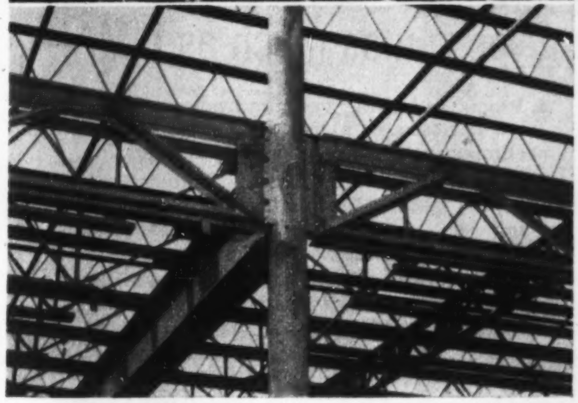

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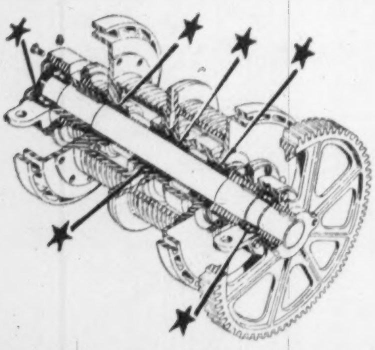

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This modern means of eliminating destructive friction benefits LIMA owners through faster operating speeds and lower upkeep. Anti-friction bearings also maintain perfect shaft alignment and insures smoother, easier clutch action.

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1. Bronze bushings in tread, idler and drive rollers are protected by piston-type dirt seal rings and retainers.
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3. Main machinery is placed well back of center of rotation to eliminate excess counterweight.
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Construction Equipment Division
LIMA, OHIO, U.S.A.

(Continued from page 100)

▲† **Rambo Constr. Co.,** 1500 S. Main St., Fort Worth, Tex., CA, **$1,722,379,** officers quarters, Laughlin Air Force Base, DEL RIO, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Feb. 24. CD 2/1.

Fisher Constr. Co., 4711 Greeley St., Houston, Tex. CA **$513,000.** incinerator, at Dump on Holmes Rd., HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex Bids Aug. 10. CD 8/19, under LB.

† **COLORADO**—Bureau P. Rds., Dpt. Commerce, Bldg. 40, Denver Federal Center, Denver,

Lowdermilk Brothers, Box 4150, Denver, Colo., CA, **$557,851,** est. $595,000 clearing, excav., grubbing, base course 7.204 mi. Forest Hy. Proj. 54-A3, B3, C3, Mt. Evans near Idaho Springs, Clear Creek Co. Bids Aug. 12, awarded Aug. 13. CD 8/17, under LB.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

Western Paving Constr. Co., 5105 Washington St., Denver, Colo., CA, **$241,249,** est. $286,259. grading, drainage, bridges, plant mix asph. surf. 0.495 mi. E. 46 Ave. between Valley Hy. and North Washington St., UF-032-1 (3), Denver Co. Bids Aug. 13.

BUILDINGS

LOW BIDS AND CONTRACTS

Zeppenfeld, Inc., 110 S. Central Ave., Clayton 5, Mo. CA Est. **$300,000.** 2½ story, 83x110 ft., brick, rein.-con. COMMERCIAL BLDG., 909 Brentwood Blvd., CLAYTON (ST. LOUIS 5 P.O.), MO. Road Realty, Inc., 3512 Crittenden St., St. Louis 18, Mo.

Sharp Bros., 101 4 E. 19 St., Kansas City, Mo. LB **$438,000.** finish 7th and 8th floors of COURT HOUSE, facilities for 3 new circuit courtrooms on 4th floor, KANSAS CITY, MO. Jackson Co., 12 and Oak Sts., Kansas City, Mo. Harvey A. Jones, c/o owner, co. engr. Alonzo Gentry, 4 W. 13 St., Kansas City, Mo., archt. CD 12/18.

▲ **Brown & Root, Inc.,** Box 3, Houston, Tex., CA **$1,956,616.** Contr. No. 29, electric POWER PLANT structure, AUSTIN, TEX. City, City Hall, Austin, Tex. Bids Aug. 10. CD 8/16, under LB.

▲ **Rambo Constr. Co.,** Box 11245, Fort Worth, Tex., LB **$1,722,379,** est. $1,500,000. Thomas Jefferson HIGH SCHOOL BLDG. UNITS, Walnut Hill Lane, DALLAS, TEX. Dallas Independent School Dist., 3700 Ross St., Dallas, Tex. Goodwin & Cavitt, 4801 Lemmon St., Dallas, Tex., archts. Bids Aug. 16.

The Austin Co., M & M Bldg., Houston, Tex., CA, **$300,000** PARTS DEPOT expansion; **$400,000** modernization, expansion of WAREHOUSING DEPOT, HOUSTON, TEX. Ford Motor Co., 5800 Clinton St., Houston, Tex. CD 8/4.

Rob. H. Smith & Co., 1915 Kolfahl St., Houston, Tex., CA, **$313,297,** 4 story, steel frame, masonry CAFETERIA, OFFICE UNIT, HOUSTON, TEX. Ethyl Corp., La Porte Rd., Houston, Tex. CD 4/12/51, under Industrial Buildings.

▲ **Centex Constr. Co.,** 4911 Greenville St., Dallas, Tex., CA, **$329,190,** (a) 30 frame DWELLINGS, concrete slab on fill; CA **$377,177** (b) 41 frame, masonry trim DWELLINGS, concrete on fill; CA **$310,000** (c) 28 brick DWELLINGS, concrete slab on fill, HOUSTON, TEX. Freeway Development Co., 5519 Lawndale St., Houston, Tex. Grand total $1,016,367. CD 6/24.

Allied Building Co., c/o Cresthaven Heights, San Antonio, Tex., Owner Builds, **$310,000.** 25 addnl. DWELLINGS, SAN ANTONIO, TEX. CD 8/6.

F. L. Scott & Sons, 2402 W. Kings Hy., San Antonio, Tex., CA **$736,945.** FINE ARTS BLDG., SAN ANTONIO, TEX. San Antonio College, 401 Navarro St., San Antonio, Tex. Bids Aug. 5. CD 8/11, under LB.

▲ **C. H. Leavell & Co.,** 1900 Wyoming St., El Paso, Tex., LB, **$1,959,440,** COUNTY JAIL, DENVER, COLO. City and Denvey Co., City and County Bldg., Denver, Colo. Bids Aug. 18. CD 7/22.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Washington**—BA 9/13—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, military installation, incl. clearing, roads, parking areas, concrete walks, pads and hardstands, etc., Olalla, ENG-45-108-55-30. Plans deposit $100. CD 6/7.

Wash., Seattle—REPAVING—BA 9/13—King Co., City-County Bldg., Seattle, Zone 4, concrete repaving center section of runway at Boeing Field. $255,000. D. L. Evans, co. engr. CD 8/13.

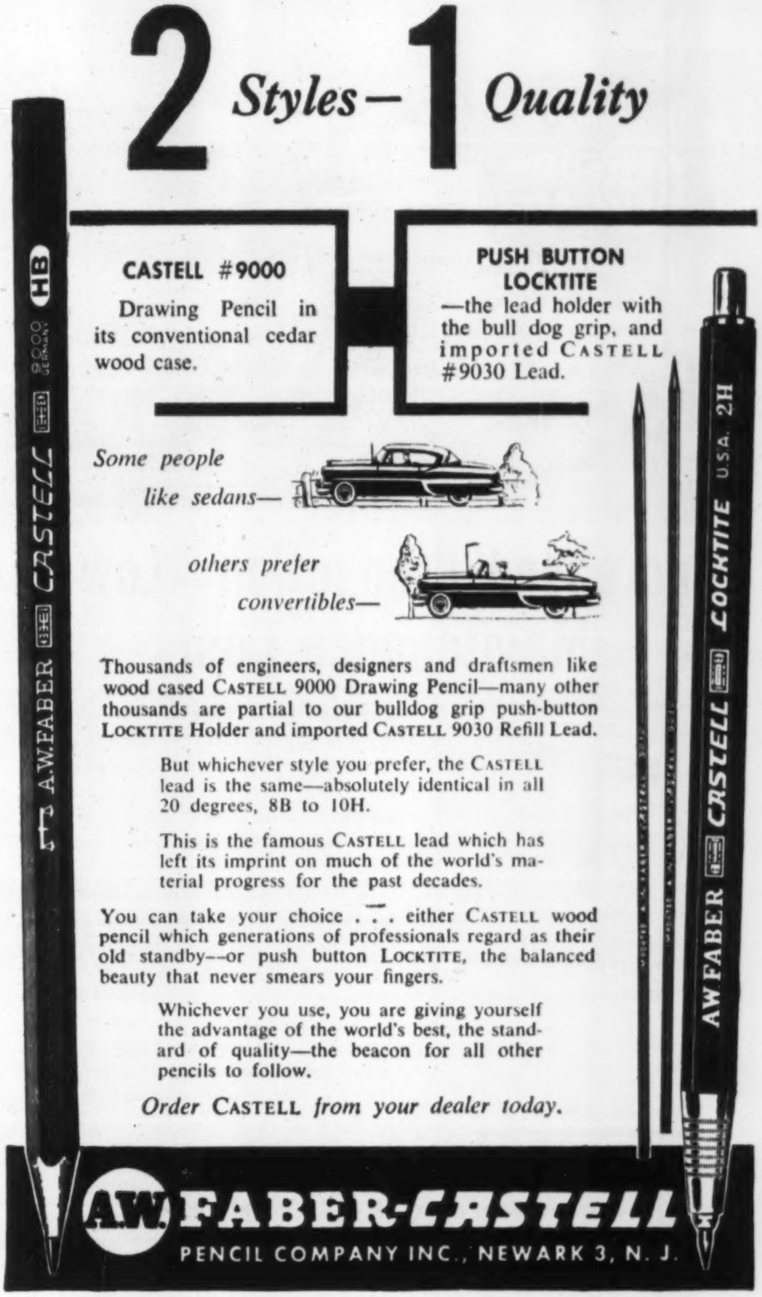
† **Idaho**—BA 9/16—U. S. Eng., City-County Airport, Walla Walla, Wash., clearing, treating, painting trashracks Lucky Peak Dam, CIVENG-45-164-55-19. CD 12/4/52.

† **Idaho**—BA 9/23—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., Sch. 1, Item 1, one pumping unit; Item 2, one pumping unit; Item 3, three pumping units, for Unit A Pumping Plant, North Side Pumping Division, Minidoka Proj., Spec. DS 4233. L. N. McClellan, ch. engr.

▲ **Calif., Los Angeles**—BA 9/24—Los Angeles County Flood Control Dist., 2250 Alcazar St., Project 1, East Compton Creek No. 1, storm drain cities of Bell, Huntington Park, Maywood and South Gate, $3,000,000. H. E. Hedger, c/o owner, engr. CD 11/7/52.

BIDS ASKED—BUILDINGS

▲ **Utah, Provo**—HIGH SCHOOL—BA 9/21—Bd. Educ., 75 S. 4th West St., high school. $1,500,000. Fred L. Markham, 45 N. University Ave., archt. CD 11/5.



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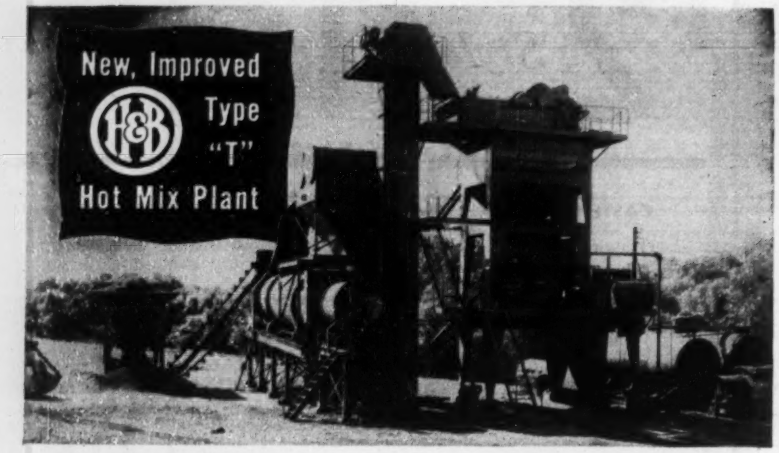

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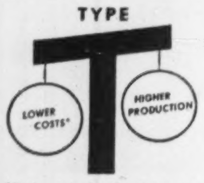

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New Structural Design—All-welded bent plate construction.

Flat Screen—Adequate screening area on all sizes.

Self-Contained Dust Bin—Empties directly into weigh box, eliminating screw conveyor.

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The new H & B Type "T" incorporates, in the basic plant, all of the major improvements of the past 20 years. New structural design and many exclusive features combine to make a plant that has already established outstanding records in both production and maintenance.

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HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **WASHINGTON**—State Hy. Comn., Olympia,

R. A. Heintz Constr. Co., 8101 N. Union Ave., Portland, Ore., LB, **$75,026,** draining, grading 4.002 mi. Headquarter Rd., F.A.S. S-1052 (1), Cowlitz Co.;

Strong & McDonald, Inc., 4045 Ruston Way, Tacoma Way, Tacoma, Wash., **$588,271,** 5.045 mi. Primary State Hy. 2, BFI-002-1 (7), Unit 1, King Co.;

Northwest Constr. Co., 3950 6 Ave. N. W., Seattle, Wash., LB, **$641,939,** b.conc., etc. 0.955 mi. twin rein.-con. slab bridges, State Hy. 1, Snohomish Co. Bids Aug. 17. CD 8/5.

BUILDINGS

LOW BIDS AND CONTRACTS

Paulsen Constr. Co., Box 2514, Salt Lake City, Utah, LB, **$812,800.** men's DORMITORY, University of Utah, SALT LAKE CITY, UTAH. State Building Bd., 19 State Capitol, Salt Lake City, Utah, Bids Aug. 10. CD 7/14.

† **J. G. Watts Constr. Co.,** 43538 Macadam St., Portland, Ore. CA, **$514,397,** est. $536,281. 60x300 ft., masonry, rein.-con. ammunition normal maintenance bldg. heating plant, storehouses, asph. con. roads, railroad track, utilities, ENG-45-164-54-26, ORDNANCE, ORE. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. CD 6/21, under LB.

M. J. Brock & Sons, Inc., 2894 Rowana Ave., Los Angeles, Calif., GA, **$508,800,** est. $360,000, MULTI-PURPOSE BLDG. at Apperson, Glenwood, Strathern & Telfair Sts., LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Aug. 11, awarded Aug. 17. CD 8/20, under LB.

▲ **K. E. Parker,** 125 South Park St., San Francisco, Calif., LB, **$1,381,000,** general contract HALL OF JUSTICE, REDWOOD CITY, CALIF. San Mateo Co. Court House, Redwood City, Calif. Bids Aug. 17. CD 7/19.

▲ **Stolte, Inc.,** 8251 San Leandro St., Oakland, Calif., LB, **$1,346,221** 4 story, penthouse COURT HOUSE, SACRAMENTO, CALIF. Sacramento Co., Court House, Sacramento, Calif. Bids Aug. 18.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ont., Ottawa**—BA 9/14—City, N. R. Ogilvie, clk., Hurdman's Bridge over Rideau River replacing existing bridges and approaches, $1,651,000. Hon. George Dunbar Bridge and approaches over Rideau River at Bronson Ave., $1,176,533. C. C. Parker & Assocs. Ltd., 745 Main St. W., Hamilton, Ont., engrs. Plans deposit $25 each. CD 6/28.

BIDS ASKED—BUILDINGS

Ont., **Goderich**—COURT HOUSE—BA 9/17—Huron County, 3 story, bsmnt., 94x100 ft., rein.-con. frame, stone court house to replace fire razed bldg. $400,000. L. G. Bridgman, Royal Bank Bldg., London, archt. Wallace, Carruthers & Assocs., 34 Isabella St. Toronto, engrs. CD 2/4/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Henry Borger & Sons, 590 Pembina Hy., Winnipeg, Man., CA, **$254,485,** WW and sewerage sys., KILLARNEY, MAN. Town, Killarney, Man. Awarded Aug. 14 CD 10/16/44.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto,

McHaffie-Birge Constr. Co., Box 275, North Bay, Ont., LB, **$228,904,** grading, culverts 3 mi. Hy. 11, near Wasi in North Bay Area;

Peel Constr. Co., 75 Main St., Brampton, Ont., LB, **$119,636,** grading, culverts 5.5 mi. Hy. 66 West of Wingham;

E. & E. Seegmiller Ltd., 525 Wendell Ave., Kitchener, Ont., LB, **$192,250,** grading, culverts 5.3 mi. Hy. 8, east of Goderich;

Scott-Jackson Constr. Ltd., 501 Evans Ave., Toronto, Ont., LB, **$388,239,** hot mix. 2.6 mi. Hy. 401 to Hy. 5, Toronto area;

Towland Constr. Co. Ltd., Box 815 London, Ont., LB, **$185,936,** hot mix paving 7.3 mi. Orillia By-Pass Hy. 11, Orillia;

Law Constr. Ltd., 225 Sterling Rd., Toronto, Ont., LB, **$263,269,** hot mix paving 13 mi. Hy. 11, Crown Hill north, Toronto. CD 4/27/44.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Cameron Contg. Co.,** 2 Croham Rd., Toronto, Ont., CA, **$3,000,000,** HOUSING, SHOPPING CENTER on 4-acre site, 6-acre school site, RICHMOND HILL, ONT. Allencourt Estates Ltd., 3451 Yonge St., Toronto, Ont. Awarded Aug. 17.

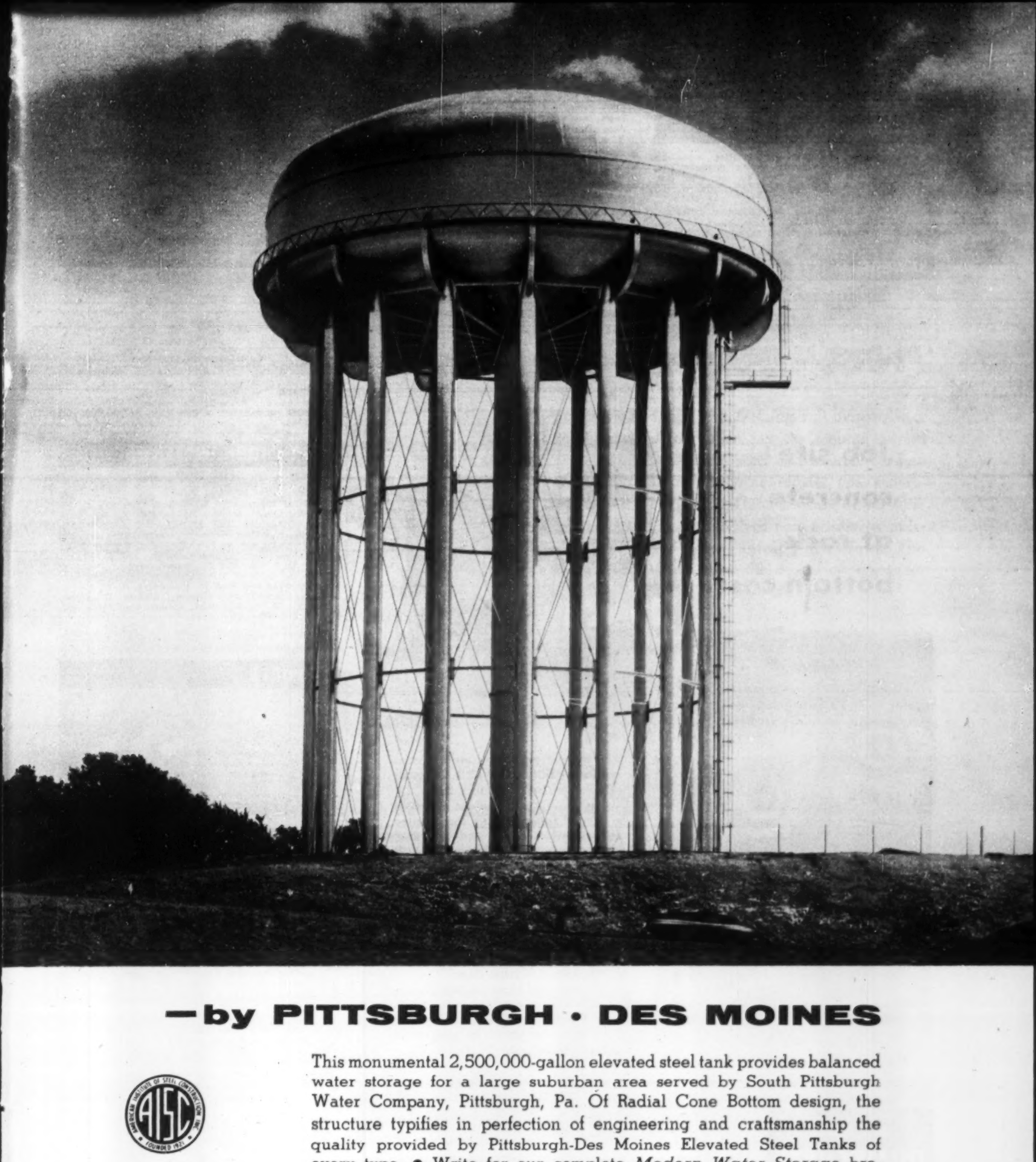
▲ **Foundation Co. of Canada Ltd.,** 892 Sherbrooke St. W., Montreal, Que., CA, **$6,500,000.** Labatt BREWERY, VILLE LA SALLE, QUE. John Labatt Ltd., Simcoe St., London, Ont. Bids Aug. 4. CD 7/23.

AMERICANS ABROAD

BIDS ASKED—HEAVY CONSTRUCTION

† **British West Indies** — FACILITIES ADDITION — BA 9/15—Office of Officer in Charge of Construction, NOY Contracts, 204 Aragon Ave., Coral Gables 34, Fla., electric facilities addn. on Grand Bahama, Eleuthera, San Salvador, Mayaguquan and Grand Turk Islands for Joint Long Range Proving Ground, NOY 85238, Spec. 44813. Plans deposit $10.

(Continued on page 106)



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This monumental 2,500,000-gallon elevated steel tank provides balanced water storage for a large suburban area served by South Pittsburgh Water Company, Pittsburgh, Pa. Of Radial Cone Bottom design, the structure typifies in perfection of engineering and craftsmanship the quality provided by Pittsburgh-Des Moines Elevated Steel Tanks of every type. ● Write for our complete *Modern Water Storage* brochure, without obligation.

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(Continued from page 104)

Proposed Projects

WATER SUPPLY

▲ **Colo., Colorado Springs**—City, City Hall, water line from Pikes Peak Reservoirs to Air Academy site, incl. 6,300 ft. tunneling and 10 mi. pipe line, **$1,500,000.** Douglas Jardine, consult. engr. CD 10/9/51.

▲ **Ill., Decatur**—City, City Hall, water works extens. **$1,580,000.** Warren & Van Praag, 253 S. Park St., Decatur, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Mass., Watertown**—Town of Watertown, Watertown-Brighton Incinerator Auth., and City of Boston, Dpt. P. Wks., City Hall Annex, Boston, incinerator, on Grove St. dump in Watertown. **$1,500,000.** CD 10/11/45.

▲ **Minn., Bloomington (P.O. Minneapolis)**—Village, D. E. McCutchan, clk., storm sewerage sys., **$1,500,000,** G. M. Orr Eng. Co., 1004 Marquette Ave., Minneapolis, consult. engr.

▲ **O., Columbus**—City, City Hall, sewage treatment plant at Big Walnut Creek and Alum Creek, **$6,000,000,** Uhlmann & Assoc., 1441 S. High St., consult. engrs.; east side trunk sewer from proposed new treatment plant to Rte. 62, **$6,000,000.** H. G. Dill, 2607½ N. High St., consult. engr. CD 12/23/52.

▲ **W. Va., South Charleston**—Sanitary Bd., City Bldg., (1) new storm sewers to intercept existing lines. Proposed 96-in. interceptor for existing drainage from Montrose Dr. and Central Ave. with adjacent areas. Also 72-in. interceptor for Dawsons Branch and Spring Branch Hill area direct to Kanawha River, **$1,271,500;** (2) sanitary sewers to intercept existing sanitary sewers and conduct to sewage disposal plant, **$932,100;** (3) pumping stations and sewage disposal plant to care for sanitary disposal. **$796,400.** Howard K. Bell, 553 S. Limestone St., Lexington, Ky., consult. engr. CD 2/16/53.

BRIDGES

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Somerville—overpass Washington St. and Northern Artery, **$3,000,000,** Thomas Worcester, Inc., 85 State St., Boston, consult. engr. CD 7/8/53.

▲ **O., Youngstown**—Mahoning Co. Comrs., Court House, bond election November 2, bridge imprvt. program. **$2,980,000.** Samuel Gould, county engr. CD 9/5/52.

▲ **Ore., Portland**—Comrs. Multnomah Co., Court House, Willamette River Bridge at Morrison St. **$12,000,000,** Moffat, Nichol & Taylor, 607 Concord Bldg., Portland, 4, Ore., with Sverdrup & Parcel, 1118 Syndicate Bldg., St. Louis 1, Mo., consult. engrs. CD 5/25.

▲ **Wash., Seattle**—City, County-City Bldg., Zone 4, extend Alaskan Way Viaduct south to Holgate St., **$4,500,000;** Broad-Mercer-Aurora Underpasses, **$1,500,000;** second Montlake Bridge, **$3,000,000;** 23 and E. Madison St. Interchange, **$345,000;** Connecticut St. viaduct from Lake Way to Alaskan Way, **$6,500,000.** W. E. Parker, city engr.

STREETS AND ROADS

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston, Sect. E-88.8 mi. West Springfield, **$8,400,000,** Knappen-Tippetts-Abbett-McCarthy, 62 W. 47 St., New York, N. Y., engrs. CD 8/11.

▲ **WASHINGTON**—Washington State Toll Bridge Auth., Olympia,
55 mi. Freeway through Seattle from Tacoma to Everett, **$175,000,000.** Tudor Eng. Co., 47 New Montgomery St., San Francisco, Calif., and J. E. Greiner & Co., 1106 N. Charles St., Baltimore 1, Md., will make engineering studies.

▲ **ALBERTA**—Dpt. Highways, Edmonton,
Calgary—65 mi. Trans-Canada Highway from Calgary to Banff via southside of Bow River, **$6,500,000.** CD 12/1/43.

EARTHWORK, WATERWAYS

▲ **New York**—Power Authority of State of New York, 270 Broadway, New York Zone 7, detailed design and supervise construction hydro-electric project on St. Lawrence River, between Massena, N. Y., and Cornwall, Ont., Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass., consult. engrs.; temporary and permanent bridges to Barnhart Island, highway bridge over Grass River, Praeger-Kavanagh, 127 E. 38 St., New York 16, N. Y., consult. engrs.; authority bldgs. on Barnhart Island, Sargent-Webster-Crenshaw-Folley, 2112 Erie Blvd. E., Syracuse 3, N. Y., consult. engrs.; general site planning, Gilmore D. Clarke, 145 E. 32 St., New York, consult. engr. Total est. **$315,000,000.** CD 11/10.

† **Pennsylvania**—U. S. Eng., 121 N. Broad St., Phila., dredging Marcus Hook, Delaware River, **$500,000-$1,000,000.** CD 2/4/44.

AIRPORTS

▲† **La., Lake Charles**—FACILITIES—U. S. Eng., Box 1229, Galveston, Tex., plans by Brown & Butler, engrs.-archts., 1213 Nicholson Dr., Baton Rouge, constr. addnl. facilities for Lake Charles Air Force Base, **$5,000,000.**

† **S. C., Charleston**—SQUADRON OPERATIONS, etc.—U.S. Eng., Custom House, plans by Halsey & Cummings & William Halleston, Chawpney's Alley, Charleston, squadron operations, gymnasium, air terminal, clothing store, library, officers mess and fire station addns., and parking area, at air base, **$821,000.** CD 5/7/52.

PUBLIC BUILDINGS

† **Calif., Lompoc**—BARRACKS—U. S. Eng., 751 S. Figueroa St., Los Angeles, plans by Albert C. Martin & Assocs., 333 S. Beaudry St., Los Angeles, 2 enlisted mens barracks at Camp Cook, **$830,412.**

▲ **Calif., Los Angeles**—COURT, etc.—Los Angeles Co., Hall of Records **$4,150,000** bond election Nov. 2, court and administration bldgs.

▲ **Calif., Los Angeles**—OSTEOPATHIC UNIT—Los Angeles Co., Hall of Records, **$9,220,000** bond election Nov. 2, osteopathic unit at General Hospital. CD 3/16.

▲ **Calif., Los Angeles**—SECURITY UNIT—Los Angeles Co., Hall of Records, **$1,563,000** bond election Nov. 2, maximum security unit at Wayside Honor Rancho, CD 1/17/49.

▲ **Calif., Oxnard**—POLICE STATION, etc.—Ventura Co., 501 Poli St., Ventura, plans by Kenneth H. Hess, 620 E. Main St., Ventura, 3 story police station, jail and city-county office bldg. **$1,000,000.**

▲ **Calif., Pasadena**—SCHOOL—Pasadena City School Dist., 315 S. Hudson St., plans by A. C. Zimmerman, H. A. Topp, E. F. Bircsak, 2439 Hyperion St., Los Angeles, and Georgi & Kline, 154 E. Pine St., Altadena, high school, **$4,000,000,** Ropp & Ropp, 455 S. Beaudry St., Los Angeles, consult. engrs.; plans by Marsh, Smith & Powell, 208 W. 8 St., Los Angeles, renovating and addns. to John Muir High School, **$2,000,000.** CD 6/15.

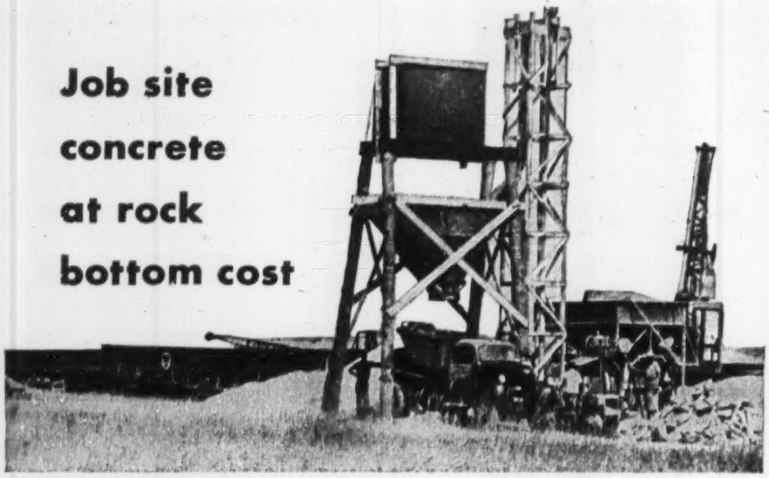
▲ **Calif., Tracy**—SCHOOLS—Tracy Union High School Dist., Tracy, **$1,038,000** bond election Oct. 22, addnl. schools.

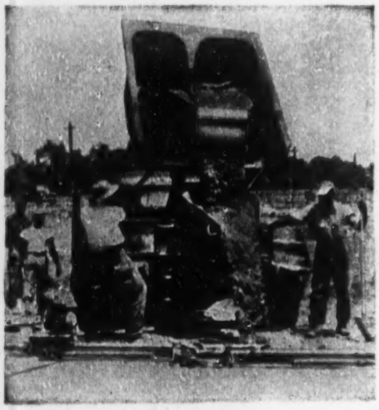
▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, housing, Ogden Ave., Scott, Larrabee and Division Sts. **$11,000,000.** CD 2/2/50.

▲† **Mass., Boston**—WAREHOUSING, etc.—U. S. Eng., 857 Commonwealth Ave., Boston, rehabilitate and

(Continued from page 108)

Job site concrete at rock bottom cost





The mixing plant you see above is not fancy. But it produced 100 yards of *top quality* concrete a day.

The Dumpcrete you see at left is a *rugged low-cost* unit that hauled every load *8 miles,* and delivered uniform concrete to the exact spot it was needed.

"We knew from experience what our 6 Dumpcretes could do," reports H. G. Helgerson, Pres. of McKoy Helgerson of Greenville, S. C. "So we set up the plant at a railroad siding 8 miles from our job at the Parris Island Marine Base."

"Our central plant and the Dumpcretes made a perfect team for handling the scattered pours," he says. "We're money ahead, because we've compared the costs."

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Is WEATHER the CAUSE of these Sub-Base and Base Course Failures?

Rough, "washboard" condition in gravel road.

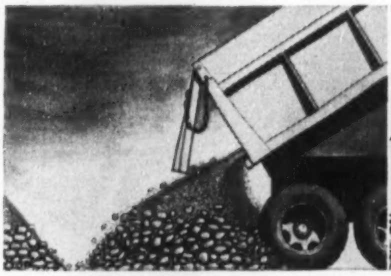
Wastage of valuable gravel "kicked" into ditch by traffic.

Cracking and faulting of bituminous surface.

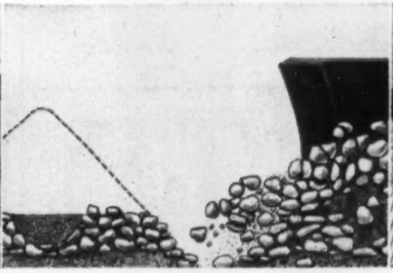
Highway surface cracked and "pot-holed".

NO! They're due to Aggregate Segregation

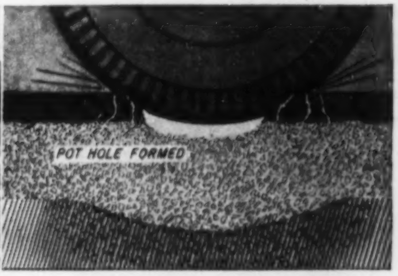
Permeation of moisture, freezing and thawing may be the immediate villian but the trouble started when these base courses were constructed. Because of the segregation of the aggregates (the separation of coarse and fines) and because of sub-base failure caused by unstabilized native soils — moisture entered and created an early breakdown. The illustrations below show the causes of aggregate segregation and of sub-base failure.



When gravel is dumped on the roadway the material forms in piles. The larger stones roll from the truck first, the fines fall last. Coarse and fines are separated. Blading to level leaves alternate pockets of coarse and fines; a highly unstable condition.

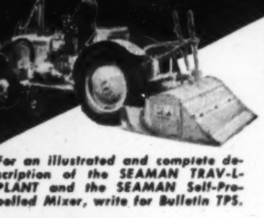


In spreading windrows to final crown and grade a different but very unstable segregation is caused. Fines are found in the "heart" of the windrow. Some of these remain in a pocket, others sift to the botton. This unstable condition remains regardless of the binder used.



Starting with a pocket of moisture which weakens the sub-base the base above begins to move under the pounding of traffic. Soon complete breakdown occurs. If the native sub-base soils had been mixed and stabilized to uniform thickness this soil reaction would not have occurred.

How the SEAMAN PREVENTS SUB-BASE AND BASE-COURSE FAILURES →



For an illustrated and complete description of the SEAMAN TRAV-L-PLANT and the SEAMAN Self-Propelled Mixer, write for Bulletin TPS.

SEAMAN MOTORS, Inc.

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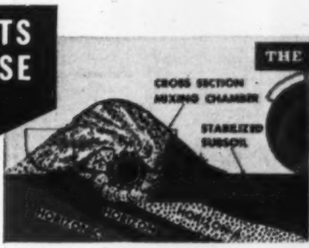
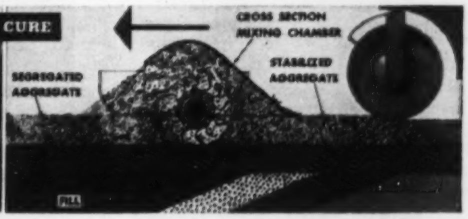


Stabilizing the sub-base by blending the sub-grade soil horizons (A, B, & C) the Pulvi-Mixer attains a uniformity in moisture, density and thickness, preventing weak spots and reducing maintenance.



Above, the Seaman Mixer is shown processing the aggregate for the base, correcting an always-present segregated condition. The material has previously been shaped to final crown and grade. No further blading is needed, for the PULVI-MIXER not only completes the mix but also leaves it in a partially compacted condition, ready for final rolling.

Field house of Montana State University is framed by 200-foot glulam timber arches spaced 20 feet on center, and purlins spaced at 7'-6". Architects were Brinkman and Lenon of Kalispell; Olsen & Kitchin, Seattle, were consulting engineers, and Hightower & Lubrecht Co. of Missoula was general contractor.

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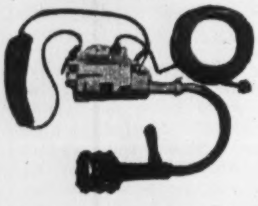

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PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

(Continued from page 106)

modernize base warehousing, piers for harbor imprvs., for Boston Army Base, South Boston, **$11,000,000,** Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs. CD 7/16, under Commonwealth of Mass., as owner.

▲ **Mass., Sharon**—SCHOOL—Town, South Main St., plans by Anderson-Nichols & Co., 150 Causeway St., Boston, high school, Pond St. between Ames St. and Lake Massaboag. **$1,500,000.**

▲ **Mich., Grand Rapids**—FACILITY HOSPITAL—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Michigan veterans Facility Hospital addn. **$5,000,000.**

▲ **Mich., Kalamazoo**—YOUTH CENTER—City, Youth Advisory Comn., Kalamazoo, youth center, incl. recreational facilities on 21 acre site, **$3,500,000.**

▲ **Minn., Rochester**—SCHOOLS—Bd. Educ., N. D. Cory, supt. Schools, voted $3,950,000 bonds July 27, high school, **$1,000,000,** grade school addns.

▲ **N. C., Charlotte**—SCHOOLS—City, Bd. Educ., J. M. Dunlap, City Hall, plans by J. A. Malcom, 1310 Berkley Ave., Ashley Park Junior High School, **$500,000;** plans by Chas. W. Connelly, 1201 Elizabeth Ave., 1 story, brick, concrete block 60,000 sq. ft. York Road Junior High School, **$600,000.**

O., Vandalia—SCHOOL—Bd. Educ., Butler Local School Dist., Vandalia, bond election **November 2, school, $640,000.** CD 9/27/50.

▲ **Okla., Tulsa**—AUDITORIUM—City, City Hall, **$5,750,000** bond election Nov. 16, civic auditorium, CD 6/28/49.

▲ **Pa., Grove City**—SCHOOL—Grove City Consolidated School Dist., Grove City, elementary and high school. **$1,900,000.** Frank D. Sturgeon, 608 Madison St., archt.-engr.

Pa., Phila.—SCHOOL—Bd. Educ., 21 and Winter Sts., plans by Lyle F. Boulware, 123 S. Broad St., Phila., elementary school, Wayne Ave. and Johnson St. **$750,000.** Bids Aug. 20 on test borings.

▲ **Pa., Pittsburgh**—SCHOOL—West Jefferson Hills Joint School Dist., R.D. No. 1, Clairton, plans by Jos. Hoover, 333 Blvd. of Allies, Pittsburgh, 1 story, steel, brick, block Senior High School addn. to Junior High School, Jefferson Boro. **$1,100,000.**

Tex., Terrell—INTENSIVE TREATMENT—Bd. for Texas State Hospitals & Special Schools, 45 and Lamra Sts., Austin, plans by Tatum & Quade, 2812 Fairmount St., Dallas, 60,000 sq. ft. masonry intensive treatment bldg., **$700,000.** Landauer & Shafer, 4801 Lemmon St., Dallas, consult. engrs. Walter C. Moore, 45 and Larma Sts., Austin, superv. engr.

▲ **Tex., Wichita Falls**—SCHOOLS—Wichita Falls Independent School Dist., Wichita Falls, bond election Oct. 2, existing high school remodeling, **$300,000;** Junior High School unit, **$895,000;** Junior High School unit, **$950,000;** No. 1 elementary school, **$310,000;** No. 2 elementary school, **$335,000;** No. 3 elementary school, **$360,000;** auditorium, **$350,000.**

▲ **Wash., Ellensburg**—SCHOOL—School Bd., Ellensburg voted $132,000 bonds, Senior High School, **$1,000,000.** J. W. Maloney, Central Bldg., Seattle, Zone 4, archt. CD 7/15.

▲ **Wis., Appleton**—HOSPITAL—Appleton Memorial Hospital Assn., 106 W. Washington St., plans by Ellerbe & Co., First Natl. Bank Bldg., St. Paul, Minn., 100-bed hospital. **$1,600,000.** CD 9/13/49.

▲ **Ont., St. Catherines**—POST OFFICE—Dpt. P. Wks. Hunter Bldg., Ottawa, plans by Wilson A. Salter 45 Queen St., 2 story post office, Church and Market Sts., **$1,500,000.** CD 2/9/53.

COMMERCIAL BUILDINGS

▲ **Calif., Anaheim**—DWELLINGS—R & W Constr. Co., 5524 N. Rosemead Blvd., 174 frame, stucco dwellings in Tract 2197, **$1,500,000.**

▲ **Calif., West Covina and Covina**—DWELLINGS—Foxtail Homes, Inc., 20353 Covina Hills Rd., Covina. 178 frame, stucco dwellings, incl. 79 in Covina and 99 in West Covina, **$1,500,000.**

▲ **Colo., Boulder**—OFFICE—Colorado Insurance Group & Colorado Credit Life Inc., 1336 Pearl St., plans by James M. Hunter, engr. and archt., 2049 Broadway, office, 14 and Walnut Sts., **$1,000,000.**

Colo., Colorado Springs—DORMITORY—Colorado College, Colorado Springs, plans by Thomas & Sweet, archts. and consult. engrs., 222 E. Bijou St., 3 story, 2 11 women student dormitory, **$913,000.** CD 8/5.

▲ **Conn., Stratford**—THEATER—American Shakespearean Festival Academy c/o Mrs. Alexander Chaten, Tomney Rd., Greenwich, theatre, **$5,555,000.**

D. C., Wash.—APARTMENT—Embassy House in the District of Columbia, Inc., Room 314, 311 Lincoln Rd., Miami Beach, Fla., plans by Wm. Chirogotis, 968 Stuyvesant Ave., Union, N. J., 8 story, masonry 190-unit apartment, 1435 Massachusetts Ave. N.W. **$900,000.**

▲ **Ill., Aurora**—CONVENT, etc.—St. Rita Parish, 815 N. Lake St., plans by Vitzthum & Burns, 1 N. La Salle St., Chicago, Zone 2, convent, gymnasium and school. **$1,000,000.**

Ill., Chicago—APARTMENT—Deer Park Bldg. Corp., 33 N. La Salle St., plans by Albert H. Nemoede, 5106 Main St., Downers Grove, 60-unit apartment, Lunt Ave and California St. **$850,000.**

▲ **Ind., Marion**—SHOPPING CENTER—Edward Stanley, 11 St. and Bypass, shopping center on Bypass. **$1,250,000.**

▲ **Kan., Merriam**—SHOPPING CENTER—R. J. Muntzel, Andy Klein, Jas. D. Wood & Reginald Moore, c/o

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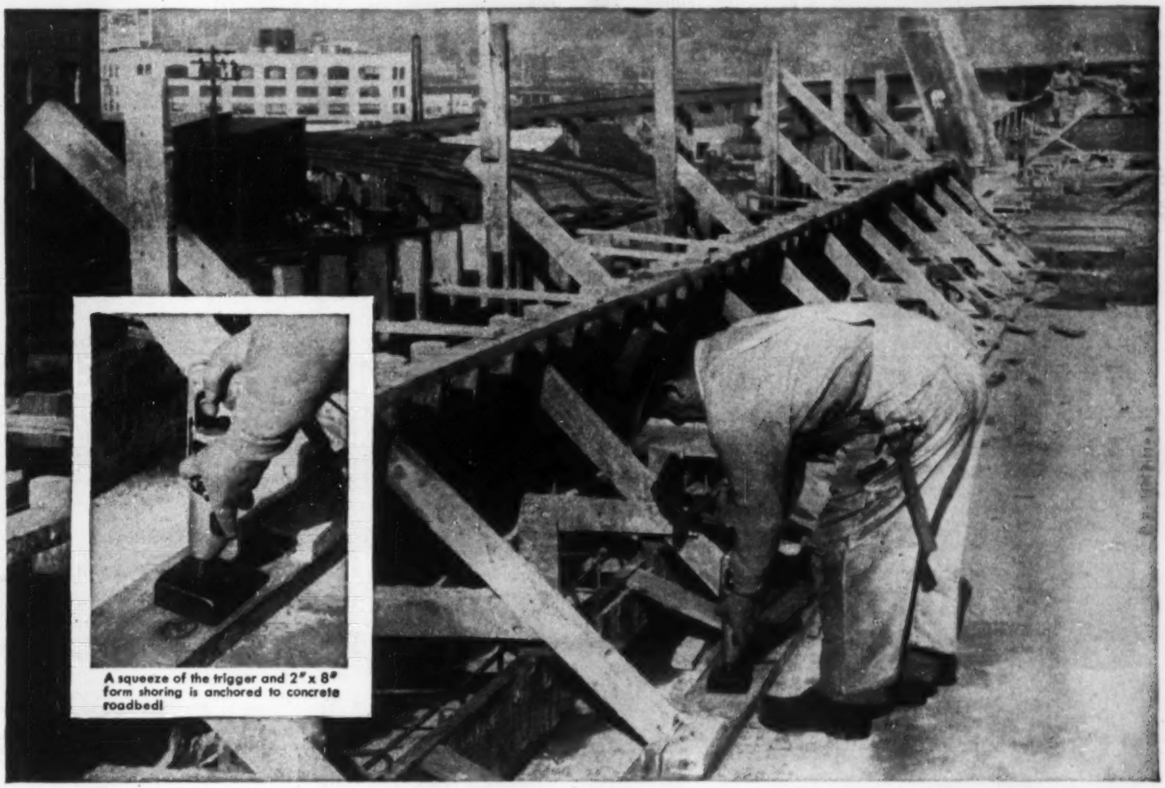

A squeeze of the trigger and 2" x 8" form shoring is anchored to concrete roadbed!

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TEMPORARY ANCHORING OF FORMS TO CONCRETE can be time-consuming and costly—but it wasn't that way on the new San Francisco Freeway. Here, the Remington Stud Driver did the job in record time by setting up to 5 fastening studs per minute!

The forms were used for pouring the Freeway's railings and curbings after the concrete roadbed had set. A workman simply moved down the base strip with the Stud Driver, and it was securely fastened! When the curbing was in, the forms were removed and the studs broken off below the concrete surface. The small craters that remained were smoothed over with grout.

SAVINGS UP TO 80% IN FASTENING COSTS ARE NOT UNCOMMON with the Remington Stud Driver. Its speed, light weight (6 lbs.), and freedom from wires and hose make it ideal for all kinds of construction fastening. Find out how *you* can save with this powder-actuated tool by mailing the coupon below.

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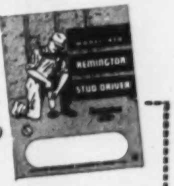
ANSWER: 32 caliber power loads are available in six grades, each designed for your specific fastening requirements.



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(Continued from page 108)

Wood Constr. Co., Mission, shopping center on 8 acre tract Kan. 10 and Martin Rd., incl. parking facilities, **$1,000,000.**

Mass., West Springfield—MONASTERY—Our Lady of Sorrows Passionist Monastery, R. C. Diocese of Springfield, Chancery Office, 60 Elliot St., Springfield, plans by Brother Cajetan, J. B. Baumann, OFM, 44 Whitehall St., New York, N. Y., monastery, retreat house addn. **$850,000.**

▲ **Mo., St. Louis**—LAW SCHOOL, etc.—St. Louis University, Very Rev. Paul C. Reinert, S. J., pres., 221 N. Grand Blvd., Zone 3, law school, field house, student union bldg., large dormitory, broad central mall, landscaping, bldgs. for Institute of Technology, chemistry dpt., liberal arts dpt. and sciences, large dormitory, service bldg. on Laclede Ave. west of Grand Blvd. and east of Grand Blvd. to Channing Ave. between Laclede Ave. to north side of West Pine Blvd. CD 6/15.

▲ **N. Y., Kew Gardens**—APARTMENT—Kew Towers, 163-18 Jamaica Ave., Jamaica, plans by Julius Fishkind, 161-19 Jamaica Ave., Jamaica, 6 story apartment, 149-05 79 Ave., northwest corner of 150 St. **$1,500,000.**

▲ **N. Y., New York**—RESIDENCE HALL—New York University, Washington Square, plans by Eggers & Higgins, 100 E. 42 St., New York, Zone 17, 9 story residence hall, Washington Square West, **$1,000,000.** CD 10/10/52.

▲ **N. Y., New York**—APARTMENT, STORES, etc.—Rhodes Development Corp., c/o Philip Birnbaum, archt., 12 E. 48 St., 15-story apartment, stores and professional offices, 7th Ave. and W. 18 St. **$1,000,000.**

▲ **O., Bellevue** — HOUSING — Ralph DeLuca, Bellaire Housing & Supply Co., Bellevue, housing development, 40-acre tract, York Twp. **$2,500,000.**

▲ **O., Cleveland**—AIR PASSENGER TERMINAL—Owner c/o Sheridan Horwitz, 7500 Stanton Ave., Zone 4, plans by Max Ratner, Oberlin, O. or c/o Community Development Inc., 9th-Chester Bldg., Zone 14, multistory 600,000 sq. ft. Air passenger terminal, incl. 200 hotel rooms, E. 18 St. and Euclid Ave. **$6,000,000.** **(Correction**-owners address). CD 8/9.

▲ **Tex., Abilene**—DORMITORY, etc.—Abilene Christian College, B. Sherrod, pres. Bd., Abilene, plans by Wilson, Patterson & Assocs., 605 Bailey St., Fort Worth, 3 story, brick, tile, women's dormitory, **$600,000;** 3 story brick, tile mens dormitory, **$750,000.**

Tex., Fort Worth—STORE—Monnig's Department Store, Otto Monnig, pres., 5 and Throckmorton Sts., plans by Preston M. Geren, 1607 Ft. Worth Natl. Bldg., addn. of floor to present store. **$750,000.**

Tex., Galveston—SUPERMARKET, etc.—J. Weingarten, Inc., 609 Lockwood St., Houston, plans by Finger & Rustay, 711 C & I Bldg., Houston, supermarket and shopping center, **$750,000.** CD 6/18.

▲ **Tex., Houston** — SHOPPING CENTERS — Frank W. Sharp, 2202 Rosslyn St., main shopping center, **$1,500,000;** No. 1 medium shopping center, **$750,000;** No. 2 medium shopping center, **$500,000;** Country Club Units. **$600,000,** for Sharpstown development zone.

▲ **Tex., Wichita Falls**—HOSPITAL—Bethania Hospital, Wichita Falls, 75-bed hospital annex, **$2,000,000.** CD 9/28/45.

▲ **Va., Little Creek** — SHOPPING CENTER — Irwin Whorton, c/o Nusbaum Real Estate, 148 Granby St., Norfolk, plans by A. N. Salkowitz, 37-60 82 St., Jackson Heights, N. Y. shopping center, **$7,000,000.**

Wash., Seattle—HEALTH CENTER—United Good Neighbor Fund, 1535 Summit Ave., community health center, **$750,000.**

▲ **Ont., Lindsay**—HOSPITAL—Ross Memorial Hospital Bd., K. G. Garbig, secy., plans by Marani & Morris, 1250 Bay St., Toronto, hospital addn., **$800,000** or new hospital **$1,260,000.** CD 9/30.

▲ **Ont., Thistletown** — HOUSING — Louis Charles, & Principal Investments Ltd., 67 Richmond St. W., Toronto, housing development, incl. 486 single family houses, 500 apartment units, 37½ acre shopping center and 3,000 car parking space, suburban Toronto, **$12,000,000.** Town Planning Consulttants Ltd., 614 Church St., Toronto, consult. engrs.

▲ **Ont., Toronto**—HOTEL—Park Plaza Corp., Avenue Rd. and Bloor St. W., plans by Page & Steele, 72 St Clair Ave. W., 11 story Park Plaza Hotel annex, **$2,000,000.** Hooper & Yolles, 880 Bay St., consult. engrs. CD 1/15.

▲ **Que., Hull** — HOSPITAL — Reverend Sisters of the Sacred Heart, Laurier Ave., hospital on 16 acre site, Gamelin St. **$4,000,000.**

INDUSTRIAL BUILDINGS

▲ **Calif., El Segundo**—ASSEMBLY PLANT—Douglas Aircraft Co., 827 Lapham St., three 185,000 sq. ft. prefabricated steel aircraft assembly bldgs. **$1,000,000.**

▲ **Ky., Louisville**—MILL, etc.—Aubrey Co. Feed Mills, 932 E. Chestnut St., 80x90 ft. square, 120 ft. high concrete, steel feed mill, 100x150 ft. warehouse, **$1,000,000.**

Mich., Milford — ADMINISTRATION — General Motors Corp., General Motors Bldg., Detroit, Milford Proving Grounds, 2 story admin. bldg., 1 story wing for plant protection, 70,000 sq. ft. **$800,000.** Argonaut Realty Div. General Motors Corp., General Motors Bldg., Detroit, engrs.

▲ **O., Struthers**—FACTORY—Neville Concrete Products, Div. of Pittsburgh Coke & Chemical Co., 1970 Grant Bldg., Pittsburgh, Pa., factory making concrete pipe, 110x200 ft. adjacent to company's blast furnace on 6 acre site, **$2,000,000.**

▲ **Okla., Oklahoma City**—POWER PLANT—Oklahoma Gas & Electric Co., 321 N. Harvey St., 112,000 kw. addn. to present Mustang power plant, **$7,500,000,** Pioneer Eng. Co., 80 E. Jackson St., Chicago, Ill., consult. engr. Leo Lash, 321 N. Harvey St., engr.

▲ **W. Va., Huntington**—PLANT—Kaiser Aluminum & Chemical Co., 1924 Broadway, Oakland, Calif., aluminum fabricating plant, **$66,000,000;** aluminum tube plant, **$1,734,000** in Ravenswood District. Site changed. CD 3/9/53, under Ky., Mentor.

▲ **Wis., Port Edwards**—RECOVERY FURNACES—Nekoosa-Edwards Paper Co., Port Edwards, recovery furnaces. **$1,500,000.**

▲ **Alta., Edmonton**—PLANT—Canada Cement Co. Ltd., Canada Cement Bldg., Montreal, Que., plant, **$1,000,000.**

UNCLASSIFIED

Calif., San Francisco—TELEVISION STATION—Television California, 717 N. Highland Ave., Los Angeles, television station (Ch. 2), **$734,000.** George P. Adair Eng. Co., 1610 Eye St. N.W., Wash. 6, D. C., consult. engr.

Fla., Miami—TELEVISION STATION—Public Service Television, Inc., 3240 N.W. 27 Ave., television station, **$882,000.** George P. Adair Eng. Co., 1610 Eye St. N.W., Wash. 6, D. C., consult. engr.

▲ **Fla., Miami**—TELEVISION STATION—South Florida Television Corp., 204 Pathman Bldg., Miami Beach, television station, **$1,067,000.** George E. Gautney, Warner Bldg., Wash. 4, D. C., consult. engr.

Fla., Miami—TELEVISION STATION—Sunbeam Television Corp., 130 Biscayne Blvd., television station. **$868,000.** Weldon & Carr, 4212 S. Bruckner Blvd., Dallas 10, Tex., consult. engrs.

Fla., North Miami—TELEVISION STATION—North Dade Video, Inc., Biscayne Blvd., Miami, television station. **$680,000.** George C. Davis, Munsey Bldg., Wash. 4, D. C. consult. engr.

▲ **Texas**—PRODUCTS PIPE LINE—H. W. Bass & Sons, Inc., Magnolia Bldg., Dallas, Tex., 152 mi. 4- to 6-in. products pipe line installation from area in Duval County to Corpus Christi, Duval, Live Oak, and Nueces Counties, San Diego area, **$1,950,000.** CD 11/11.

▲ **Texas**—RURAL DISTRIBUTION LINES—Lower Colorado River Electric Co-operative, San Marcos, tie lines, distr. lines, sys. headquarters imprvs., Hays Co., **$1,065,000.** REA allot. CD 4/9/53.

▲ **Wash., Seattle**—WHARF—Standard Oil Co. of California, 225 Bush St., San Francisco, Calif., wharf with pipe lines, warehouse, etc. to replace structure, **$1,000,000.**

HARD-PACKED CLAY
couldn't stop this
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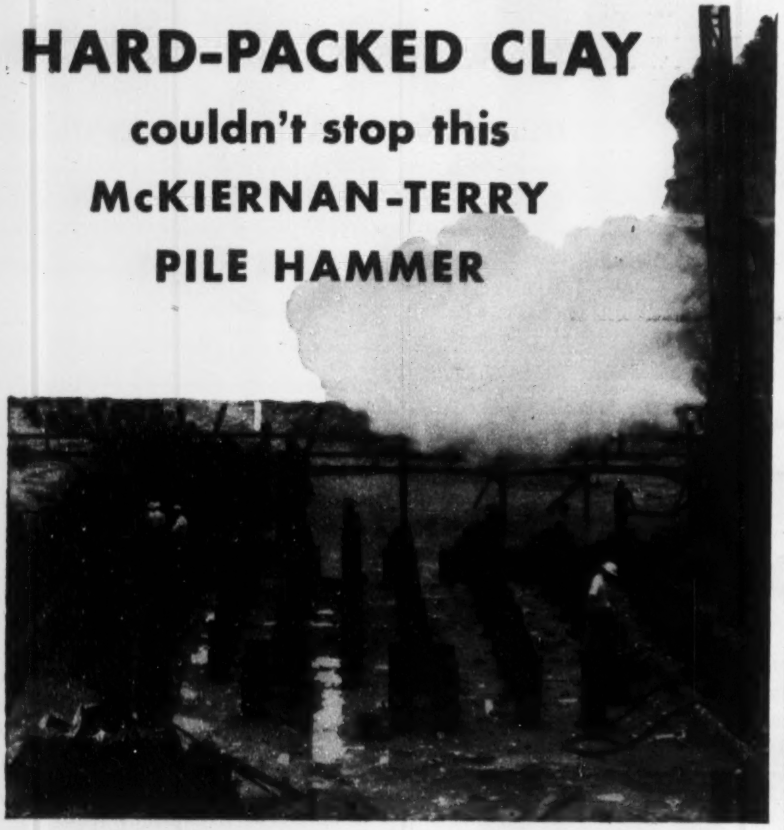
PILE HAMMER



To prepare the foundation for the concrete spillway of a new Texas dam, many, many piles were needed . . . 2,127 of them. In addition, the piles had to be driven into resistant, hard-packed clay.

It might have been a tough and lengthy job, but not to the powerful, fast-driving McKiernan-Terry 11B3 Double-Acting Pile Hammer wisely selected by the contractors, Reynolds & Williams and Noonan Construction Co.

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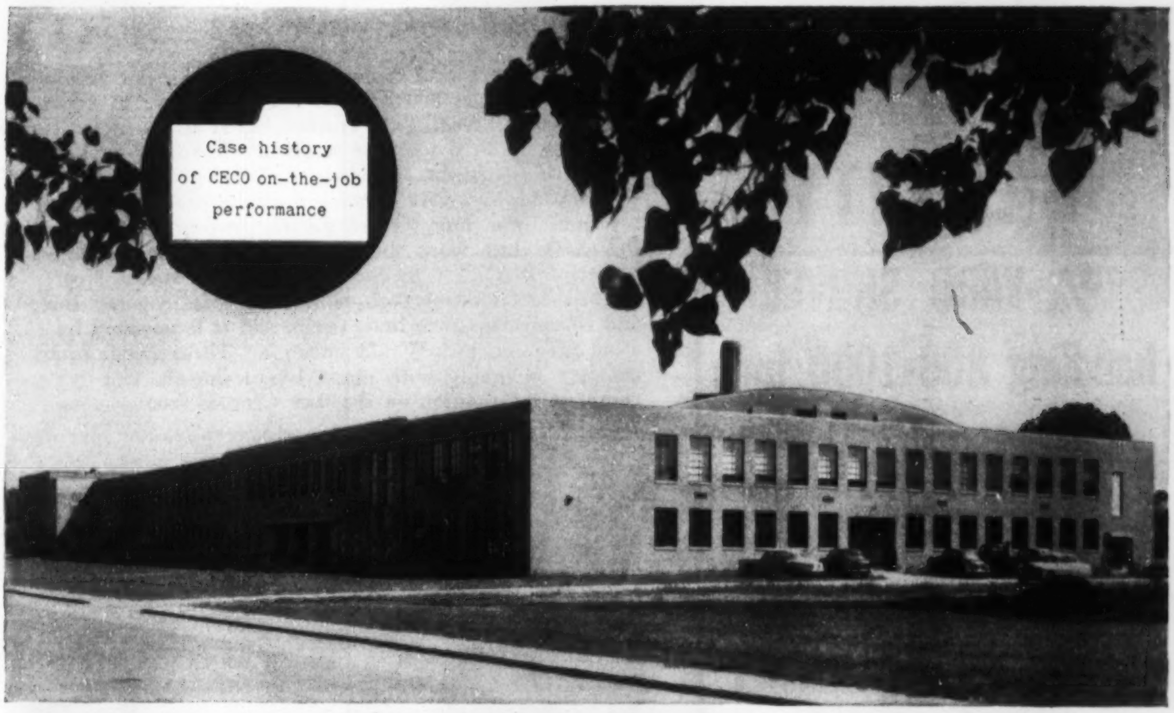
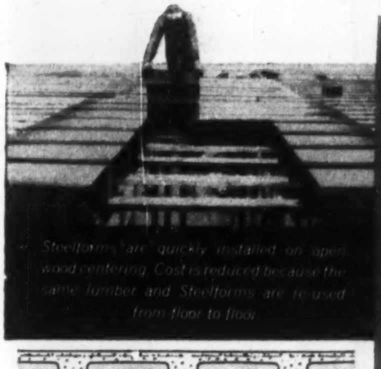
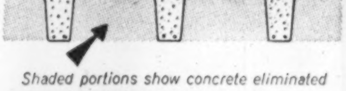


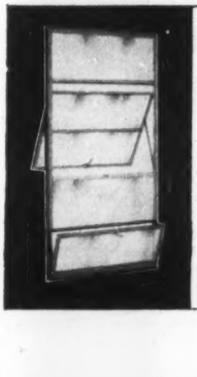
How Ceco-Meyer steelform construction cut floor weight 40%



Steelforms are quickly installed on open wood centering. Cost is reduced because the same lumber and Steelforms are re-used from floor to floor.



Shaded portions show concrete eliminated by concrete joist construction.



Ceco's rugged 1½" Intermediate Projected steel windows are made to outlast any structure. Combined weight of frame and ventilator members not less than 3.6 pounds per lineal foot.

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When Karl Keffer Associates, architects, designed the Charles Evans Junior High School in Ottumwa, Iowa, they faced exacting requirements:

> The structure had to provide all instructional units, plus shops, lunch room and auditorium for a minimum of 875 students . . . plus a gymnasium for a seating capacity of 4,500 . . . and this had to be done on a rigid budget.

Ceco-Meyer Steelform Construction was selected as the best way to span the 22′ to 24′ wide rooms . . . a natural choice by architects for thousands of schools. The method eliminates beams, thus allowing a flat ceiling for all rooms. Rigidity and soundproofing are provided . . . plus a saving of 40% in dead load over other types of reinforced concrete. Since Steelforms are quickly placed and removed, pouring of concrete is speeded, with weeks of construction time saved. Total cost of the Evans School was only $12.13 per sq. ft. When it came to windows, Ceco's 1½" Intermediates got the call. Heavy 1½" sections assure smooth operation and long life. Maintenance is negligible. Large glass lights provide open view . . . controlled daylighting guards pupils' eyesight. As on thousands of projects, Ceco supplied the Reinforcing Steel on schedule . . . Ceco Integrated Service brought all products to Contractors Ringland-Johnson, Inc., as needed. Result . . . a better structure . . . building budget balanced. Here is another example of Ceco performing on the Architect-Contractor-Supplier team. Ceco Product Specialists help you save through product engineering. Consult Sweet's File for address. CECO STEEL

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Write for these catalogs describing BAY CITY Crawlers of ½ yards and up, BAY CITY CraneMobiles and CraneWagons in capacities to 25 tons.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
September 8 Massachusetts
STREETS AND ROADS
September 8, 14 Massachusetts

BIDS ASKED—BUILDINGS

▲† **Massachusetts**—BA 9/21—U. S. Eng., 80 Lafayette St., New York, N. Y., Adams Flood Control Project Unit 3, Hoosic River Basin, ENG-30-075-55-10. $3,000,000-$4,000,000. Plans deposit $10. Extended date. CD 8/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,
The Savin Constr. Corp., 10 Village St., East Hartford, Conn., CA, **$2,775,683**, grading, drainage, paving Hartford-Springfield Expressway, Hartford-Windsor, FA Proj. UI-139 (12), Bids July 12, awarded Aug. 18. CD 7/19, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **The Wadhams & May Co.**, 15 Lewis St., Hartford, Conn., CA, **$1,980,000**, Public LIBRARY, Sheldon Arch and Prospect Sts., HARTFORD, CONN. City, 550 Main St., Hartford, Conn. Bids Aug. 3. CD 8/6, under LB.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

STATE HIGHWAY LETTINGS
BRIDGES
September 7 Maryland September 14 New Jersey
September 15 Delaware September 16 New York
STREETS AND ROADS
September 7 Maryland September 8 Delaware
September 14 New Jersey September 16 New York

▲† **Del., Dover**—RUNWAY, etc.—BA On Or About 9/24—U. S. Eng., 2635 Abbotsford Ave., Phila., Pa., runway and taxiway alterations, warm-up pads, and runway lighting, Dover Air Force Base, ENG-36-109-55-11. $3,000,000. Whiteside, Foster, Damon & Doane, Inc., Penna. Bldg., Wilmington, archt. and engr. CD 5/13, under LB.

BIDS ASKED—BUILDINGS

▲ **Pa., Wayne**—APARTMENT—BA 9/16—At office C. Frederick Wise, archt., 101 Charles Dr., Bryn Mawr, 320-unit apartment, restaurant and garage for Owner, c/o Matthew Weinstein, 101 Charles Dr., Bryn Mawr. $2,000,000.

▲ **Pa., Lima**—HOSPITAL—BA 9/21—Comrs. Delaware Co., Media, hospital, dormitories, admin. and commissary bldgs., site imprvs., road, utilities and tunnels, Fair Acres. $2,500,000. Extended date. George M. Ewing, Western Savings Fund Bldg., Phila., archt. CD 7/7.

▲ **Pa., Abington**—HIGH SCHOOL—BA 9/23—Abington School Dist., Abington, Abington Senior High School. $3,000,000. Joseph Wigmore, 117 S. 17 St., Phila., archt. Lambert-McGee Assocs., 1629 Chestnut St., engrs. CD 9/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Zara Contg. Co.**, Engel St., Hicksville, N. Y., LB **$1,632,100**, sewerage sys. to serve Roosevelt Field-Carle Place Industrial area, incl. 50,000 ft. lateral sewer lines and 22,000 ft. trunk sewers, Carle Place, MINEOLA, N. Y. Bd. Supervs., Nassau Co. Old County Court House, Mineola, N. Y. Bids Aug. 24. CD 8/4.

▲ **NEW JERSEY and PENNSYLVANIA**—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.
Conduit Foundation Corp., 158 N. 20 St., Phila., Pa., LB, **$1,964,678**, Contract P-2, viaduct substructures for Philadelphia approaches from Philadelphia Anchorage to Second St., new bridge, Phila., Pa., to Gloucester, N. J. Bids Aug. 12. CD 7/26.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Hall Developers, Inc.**, 183 Willoughby Ave., Brooklyn, N. Y. Own Forces. **$20,000,000**. nine 14 story APARTMENTS, Emerson Pl., Myrtle Ave., Hall St., Willoughby Ave., St. Johns Pl., Lafayette Ave., Classon Ave. and DeKalb Ave., BROOKLYN, N. Y. S. J. Kessler & Sons, 551 Fifth Ave., New York 17, N. Y. engrs.-archts. CD 5/25.

▲ **Long Life Industries**, 315 4 St., Lakewood, N. J. Separate Contracts, **$6,000,000**. 500 unit RESIDENTIAL DEVELOPMENT, various locations, LAKEWOOD, N. J. Edward M. Annitto, 715 Mattison Ave., Asbury Park, N. J., archt.

▲ **Leo Kornblath**, 256 E. 49 St., New York, N. Y., CA, **$3,000,000**. SHOPPING CENTER, Lincoln Hy., FALLSINGTON, PA., Leo Kossove, 400 Madison Ave., New York, N. Y. Morris Lapidus, 256 E. 44 St., New York, N. Y., archt.

▲ **Stanwood Corp.**, Eddington, Pa., Separate Contracts. **$25,000,000**. 2,500 RESIDENCES, SHOPPING CENTER (12), elevated water storage standpipe, 3,000,000 gals. in Bensalem Twp., EDDINGTON, PA.

▲ **John McShain, Inc.**, 17 and Spring Garden Sts., Phila., Pa., CA **$2,000,000**. Southeast Catholic Girls HIGH SCHOOL, PHILA., PA. Roman Catholic Archdiocese of Phila., 310 N. 19 St., Phila., Pa. Bids July 27. CD 7/16.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
September 21 Florida September 22 Louisiana
STREETS AND ROADS
September 22 Louisiana

BIDS ASKED—BUILDINGS

▲ **Ala., Tuscaloosa** — HOTEL — BA 10/1 — **Tuscaloosa** Hotel Corp., P.O. Box 400, hotel, $1,500,000. Don B. Schuyler, Tuscaloosa, archt. CD 9/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Bruce Constr. Corp.**, 1118 NE. 2 Ave., Miami, Fla. LB. **$4,867,605** dormitories and mess halls, at Homestead Air Force Base, Inv. 55-7, HOMESTEAD, FLA. U. S. Eng., P.O. Box 4870, Jacksonville, Fla. Bids Aug. 24. CD 7/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Kaiser Aluminum & Chemical Co.**, 1924 Broadway, Oakland, Calif., Own Forces, Total Est. **$66,000,000**. 400,000 sq. ft. PLANT (first unit) at Willow Grove on Ohio River, RAVENSWOOD, W. VA. CD 8/16/54, under W. Va., Huntington.

▲ **Englewood Homes**, c/o C. A. Anderson, P. O. Box 6427, Orlando, Fla., Force Account, **$7,000,000**. 1,200 RESIDENCES, ORLANDO, FLA.

▲ **Algernon Blair**, First National Bank, Montgomery, Ala., CA, **$1,600,000**, 155 RESIDENCES, MONTGOMERY, ALA. Perry Hills Homes, First National Bank Bldg., Montgomery, Ala.

▲ **J. R. Coarsey & H. H. Richardson**, Madison, Tenn. Owner Builds. **$2,000,000**. 200 RESIDENCES, DONELSON, TENN.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
September 8 Michigan September 9 Indiana
STREETS AND ROADS
September 8 Michigan

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Saul S. Biskind**, 4407 Brookpark Rd., Cleveland 9, O. Owner Builds. **$2,750,000**. one hundred eighty-six 1½ story frame HOMES, Standfield Dr., Center Dr., and Park Dr., PARMA, O.

▲ **Mel Freeland**, 23231 Hilliard Rd., Rocky River 16, O. Owner Builds. **$3,300,000**. one hundred and five 1½-story ranch type, brick and/or frame and stone DWELLINGS, between Hilliard and Detroit Rds., WESTLAKE, O.

▲ **Durable Constr. Co.**, 127 N. Main St., Wheaton, Ill., Own Forces, **$3,000,000**. 140 HOUSES, near WHEATON, ILL.

▲ **Perron Constr. Co.**, 6525 Lincoln St., Detroit, Mich., CA, Est. **$2,000,000**. Isotope LABORATORY, pumphouse and sub-station, WARREN, MICH. General Motors Corp., General Motors Bldg., Detroit, Mich. CD 8/13.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTFUCTION

STATE HIGHWAY LETTINGS
BRIDGES
September 14, 15 Texas
STREETS AND ROADS
September 14, 15 Texas

▲† **Tex., Abilene**—DORMITORIES, etc.—BA 9/15—U. S. Eng., 100 W. Vickery St., Fort Worth, air force dormitories, dining halls, Airmen—2 Line—296 seats, Abilene Air Force Base, Inv. No. ENG-41-443-55-5. $1,500,000. Harley, Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, Mich., archt. CD 12/10/52.

▲† **Ark., Blytheville**—DORMITORIES—BA 9/23—U. S. Eng., P.O. Box 867, Little Rock, 7 dormitories, airmen's dining hall, Blytheville Air Force Base, Serial No. ENG-03-050-55-17. $1,000,000-$3,000,000. CD 12/1/53.

BIDS ASKED—BUILDINGS

▲ **Tex., Orange**—HOSPITAL—BA 9/15—**W. Orange Co.**, Orange, 5 story, part bsmnt., 160-bed. 85,000 sq. ft. brick, rein.-con., etc. hospital. $2.500,000. Plans deposit $50. Extended date. **Golemon & Rolfe**, 5102 Travis St., Houston, archts. **Bernard Johnson** & Assocs., 4926 Travis St., and **Walter P. Moore**, 2 Pinedale St., Houston, engrs. CD 8/24.

▲ **Tex., San Antonio**—OFFICE—BA 10/5—United Services Automobile Assn., 1400 E. Grayson St., 7 story, bsmnt. home office. $2,000,000. Extended date. Phelps & DeWees & Simmons, 342 W. Woodlawn St., Box 8127, Laurel Heights Station, and **Atlee B. & Rob. M.** Ayres, 342 W. Woodlawn St., Box 8237, Laurel Heights Station, archts. CD 8/11.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Algernon-Blair, Inc.**, Gaston J. Greil, Box 749, Montgomery, Ala., CA, **$5,000,000**. 482 one story, frame RESIDENCES, in Western Hills, near DENVER, COLO. Barr Lumber Co., 5055 Washington St., Denver, Colo. Ralph D. Peterson, 1701 Gilpin St., Denver, Colo., engr.-archt.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
September 15, 16 California

▲ **Wash., Seattle**—BA 10/6—Bd. P. Wks., City, County Bldg., Zone 4, concrete hydro-electric dam 150 ft. high on Skagit River at gorge. $17,000,000. Plans deposit $25. CD 4/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Morrison-Knudsen Co.**, 900 W. 15 North St., Salt Lake City, Utah, LB **$1,948,822**, Schedule 2, use of precast concrete pipe in siphon, Weber Basin Proj., Spec. DC 4207, UTAH. Bureau Reclamation, Dpt. Interior, Ogden, Utah. Bids Aug. 24. CD 7/15.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,
Frederickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif. and **M. & K. Corp.**, Financial Center Bldg., San Francisco, Calif., CA, **$1,661,111**, portion of bridge, pedestrian undercrossing, road work, etc. at Eastshore Freeway between Market and 11 Sts., Oakland, Alameda Co.;
Ukropina-Polich-Kral & John R. Ukropina, P. O. Box 105, San Gabriel, Calif., CA, **$737,020**, rein.-con. open spandrel arch and slab span bridge across Dog Creek near Redding, Shasta Co. Bids Aug. 4, awarded Aug. 18. CD 8/16, under LB.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,
Madonna Constr. Co., P. O. Box 910, San Luis Obispo, Calif., CA, **$1,598,111**, 3.5 mi. between Arroyo Grande and Pismo Beach, San Luis Obispo Co.;
Guy F. Atkinson Co., 10 W. Orange St., South San Francisco, Calif., CA, **$1,288,816**, grading 0.9 mi. San Mateo-San Francisco Co. line, San Mateo Co. Bids July 28, awarded Aug. 12. CD 8/4, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Albert Gerson**, 6363 Wilshire Blvd., Los Angeles, Calif., CA, **$1,757,600**. 209 frame, stucco DWELLINGS, Alburtis, Fallon and Millgrove Sts., WHITTIER, CALIF. Darnell Bldg. Co., Carlyle Bldg. Co., Allison Bldg. Co., Eden Bldg. Co., 6363 Wilshire Blvd., Los Angeles, Calif. Wm. A. Bray, 962 N. La Cienega St., Los Angeles, Calif., archt.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Saskatchewan Wheat Pool**, Regina, Sask., Own Forces, **$2,000,000** 20 grain ELEVATORS at various points, REGINA, SASK. CD 6/16.

LATIN AMERICA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Smith Engineering & Constr. Co.**, Pensacola, Fla. CA, **$2,793,565**, grading, paving, drainage, runways, taxiways, apron of Airports at Quito and Guayaquil, ECUADOR. Republic of Ecuador, Quito, Ecuador. Airways Engineering Corp., 1212 18th St. N. W., Wash., D. C., design and supervision of construction. CD 3/29.

AMERICANS ABROAD

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Oman Constr. Co., R. F. Farnsworth & Wright** Constr. Co., Acklen Park, Nashville, Tenn., CA **$18,616,633**. Fix price. air force facilities, AZORES. U. S. Eng., Atlantic District, 346 Broadway, New York 15, N. Y.

(Proposal Advertisements see pp. 121 to 123)

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CHOOSE
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DRILLS

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UNIT PRICES

Hangar fire protection water supply, Texas

Pump station and storage reservoir for the maintenance hangar at Bergstrom Air Force Base, Austin, Texas, was awarded by the U. S. Corps of Engineers, Fort Worth, to Santone Construction Co. at $105,087, 5% under second low bid and 12% below the $119,061 estimate. Five of the 15 bids received are under the estimate.

Lump sum bids by Santone Constr. Co., San Antonio, give them a $8,660 advantage over second bidder Lufkin Constr. Co. which narrows to $5,812 when all items are counted.

The water storage tank could be either prestressed concrete or elevated steel, at the contractor's option. Santone chose steel. The contract calls also for site grading, roads, drainage, sidewalks, and utility lines.

All materials will be furnished by the contractor.

He is allowed 210 calendar days to complete work.

Payment will be made to the contractor at $1.10 per bag for all cement used in excess of the average bags per cu yd specified. The Army will be reimbursed the same for all cement saved by using less than the average. Second bidder's price for cement is $1.00 per cu yd.

Operating engineers receive $2.90, carpenters $2.75, unskilled labor $1.25, and reinforcing ironworkers $2.45 per hour.

Bidders include:

1C	Santone Constr. Co., San Antonio 9, Tex...	$105,087
2	Lufkin Constr. Co., Inc., Lufkin, Tex.	110,899
15	O. J. Broughton, Dallas, Tex.	141,768
EE	U.S. Corps of Engineers, Fort Worth, Tex...	119,061

Bids: 3-4-54 Item	Unit	Quantity	Unit Prices 1 C	 2
Pump sta incl conc park apron	ls	1	$63,019	$70,071
Ground storage water tank.	ls	1	23,938	25,861
Drilled piers 18" ϕ	lf	65	5.00	2.60
Sewer line 6"	lf	125	2.50	1.48
8"	lf	255	3.00	2.00
Cleanouts	ea	2	200.00	45.00
Manholes	ea	3	475.00	221.00
Exc, trench & backfill-sew line & 6" water mn.	lf	515	0.50	1.00
Gas line 1"	lf	40	1.00	2.05
valve w box	ls	1	90.00	35.00
conn to exist line	ls	1	50.00	55.00
Exc, trench & backfill-gas line	lf	40	0.50	0.80
Water line 6"	lf	135	2.58	4.00
12"	lf	145	6.91	6.00
16"	lf	375	10.24	11.00
valve & box, 6"	ea	1	275.00	95.00
Exc, trench & backfill-water line 12" & over	lf	520	2.00	1.50
Replace exist pavement	sy	125	3.00	4.00
Exc, embank, site gr & subgrade prep	ls	1	320.00	650.00
Flexible base course	cy	100	5.00	4.00
Bit prime coat	sy	350	1.00	0.10
tack coat	gal	35	1.00	1.00
Rock asph wear surface	ton	25	50.00	15.00
Pipe-arch culv 18x11"	lf	60	15.00	5.00
Rem & salvg exist culv	ls	1	250.00	60.00
Pullbox	ea	1	175.00	165.00
4-duct bank conc encased	lf	110	7.00	9.00
direct buried	lf	240	4.00	2.40
Underground wiring	lf	880	$1.00	$1.50
Aerial distribution	ls	1	1,175	815.00

Close bids on Hudson bridge superstructure

With margins of only 1.4% under second, 2.0% under third and high for the Kingston-Rhinecliff Bridge superstructure, the contract for $9.5 million was awarded to Harris Structural Steel Co., New York, N. Y., by the New York State Bridge Authority. David B. Steinman, N. Y., is consulting engineer.

This contract brings the total cost of the bridge to $13,992,000, some 22% under the estimate. The substructure, bid in April, cost $4.5 million (see ENR June 17, 1954, p. 123 for unit prices).

This highway bridge across the Hudson River in Ulster and Dutchess Counties consists of continuous trusses over river piers, and plate girders over land piers. It has a 36-ft roadway and is 7,793 feet between abutments.

In contrast to large differences between bids on substructure items, superstructure items are close. The Harris bid is 4% above the second on structural steel for truss spans, a $240,000 difference; and 13% below on the girders, a $185,000 difference. That makes second bidder $55,000 ahead on structural steel; but Harris bids are lower on ten of the 14 contract items to make him low bidder by $133,681. Prices for portland cement increased 20¢ a barrel from April to July.

Wage rates include a minimum of $2.10 per hour for common labor, $3.50 for stationary engineers, $3.60 for ironworkers, $3.625 for dock builder journeyman, $2.875 for carpenters.

Time limit for completion of the superstructure is 820 calendar days. The contractor must pay $1,000 for each day's delay after that.

Bidders include:

1C	Harris Struct. Steel Co., New York, N. Y...	$9,496,432
2	Bethlehem Steel Co., Bethlehem, Pa.	9,630,113
3	American Bridge Co., New York, N. Y.	9,687,724

Bids: 7-26-54 Item	Unit	Quantity	Unit Prices 1 C	 2
WI pipe	lf	1,000	$21.00	$21.45
Portland cement	bbl	13,920	4.50	6.55
Concrete	cy	8,700	74.85	89.50
Steel fabric	sy	110	1.00	1.20
Reinf bar	lb	1,712,000	0.14	0.167
Struct stl, truss span	lb	23,963,000	0.28	0.27
girder	lb	5,772,000	0.2095	0.2415
Welded bearings	lb	345,600	0.385	0.374
Castings	lb	125,400	0.42	0.45
Misc metals	lb	28,840	0.32	0.53
Railing, struct	lf	15,500	20.80	22.00
1½" pipe	lf	16,560	4.00	2.10
2" pipe	lf	4,500	4.00	2.35
Paving, concrete	cy	12	25.00	36.00

Equipment shipments move up with ENR awards

But there is a buyers' market in equipment this year, as tough competition squeezes contractors' profit margins

J. P. Chamberlain
Associate Editor
An ENR Staff Report

In a year when government statistics show that construction is booming as never before, the makers of construction equipment have been facing a paradox: For many of them, sales in the first half were below last year.

Now the tide has definitely turned, as ENR predicted (ENR June 24, p. 90). ENR's index of physical volume of shipments of earthmoving and excavating equipment—based on figures that become available this week—shows a smart upturn for the second quarter (chart, below). This upturn is in line with the rise in physical volume of ENR contract awards during the second quarter.

Both these indexes are based on dollar volume in 1949, and allow for changes in equipment prices and construction costs since then.

However, while physical volume of construction awards is about where it was last year, you can see from the chart that physical volume of equipment shipments during the second quarter was still far behind the same period last year.

• Change in psychology—An ENR survey of contractors, equipment makers, and distributors around the U.S. indicates that over the past year or so the buying psychology of contractors has changed:

With equipment available for immediate delivery and with comparative price stability—if not price weakness—the contractor no longer buys in anticipation of future requirements. He buys only as needed.

This new attitude ties right in with this year's fierce competition among contractors for business. When contractors are doing jobs on low profit margins, they often feel that they can't afford new equipment. So they may use what they have, even though it may not be the most economical for use on their particular jobs. The ENR survey also found that many contractors are repairing and rebuilding equipment more than they used to in past years, in order to postpone buying new units.

Take highway work, for instance. Because a number of recent big road jobs were located in the Midwest, manufacturers realized that there wouldn't be much rock to move and therefore anticipated that these jobs wouldn't boost sales of shovels. But at least one manufacturer figured that since most of the earth-moving on these jobs would be done by tractor-scraper combinations, sales of these items would be increased. He guessed wrong. On one job, for instance, the contractor used loaders and bottom-dump wagons that he already had. Though scrapers might have been more efficient, the contractor preferred to conserve his cash.

• Prices and terms—For many months, the buyers' market in equipment has been showing up in prices and financing terms. Distributors have done some price cutting, and have become liberal about trade-in allowances on old equipment, which of course is another form of price cutting.

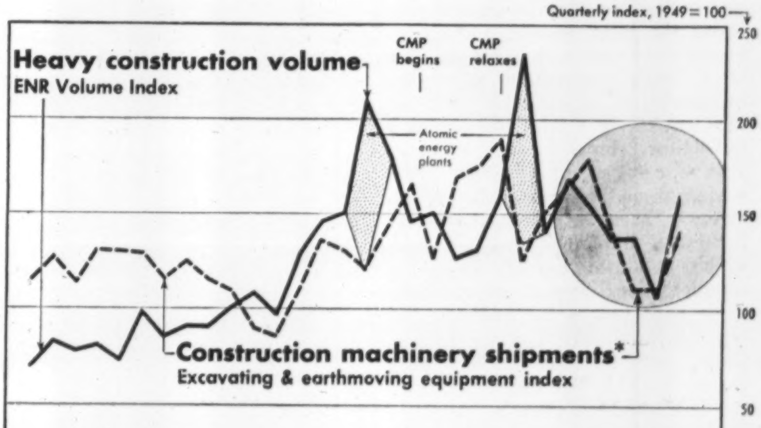
The practice of renting-with-option-to-buy is on the increase. Naturally, this puts quite a financial burden on the distributor. However, manufacturers have grown more generous about financing dealer purchases through so-called "floor plan" arrangements. And there have been some outright consignments of equipment, on the theory that the equipment might as well be in the distributor's yard as in the manufacturer's.

In some parts of the U.S. where the competition between distributors is especially keen, distributors have been known to rent equipment with the understanding that the contractor would pay an hourly rental on the basis of actual use. In other words, a contractor might rent a tractor, take it to his job site, and use it only part of the time. In that case, he would pay only for the time he used it, although the equipment was pretty much unavailable for sale or rental to anyone else while it was on his job.

• Used-equipment auctions—One way to get a line on prices of new equipment is to watch the trend of prices in the used-equipment market. For instance, take the big auction, last week at San Francisco's Cow Palace, of equipment owned by contractors who were getting out of business or who wanted to clear their yards of excess machines. Big equipment sold cheaper than most people at the auction had expected.

• Government orders—Of course one important reason for the buyers' market in equipment is the decline of government purchases—especially military orders. It's difficult to judge how large this government business has been running, since manufacturers have different ways of reporting it in

(*B&F continued on page* 116)



their sales figures. People who know the industry well, however, will tell you that government orders provided a substantial part of the total business. The loss of this government business has hurt some manufacturers a lot more than others.

This situation in the construction industry is much the same as for U. S. industry in general. For years, manufacturers have been building up their inventories of materials. But during the past twelve months, they have been cutting down on inventory and replacing it only as needed. It is the same with contractors, who for years have been building up their "inventory" of equipment. Much of this is still fairly new. And so contractors have been inclined to use up some of their machines before buying more.

• **The order-taking salesman**—There is still another important factor that shows up if you talk to distributors and manufacturers—the problem of a sales force which for more than a decade has been writing up orders rather than selling. Younger salesmen have never known what it means to sell in a buyers' market, and many older men have forgotten. As one sales vice-president puts it: "To sell these days, you have to get out on jobs and know your equipment so well that you can show the contractor in dollars and cents what he will save by buying your machinery." That means higher sales costs for distributors, since contractors now want to be shown by on-the-job demonstrations of the equipment.

There are personal readjustments, too, for distributors. Some of them who have been in the business for many prosperous years have put much of their capital into other lines. Older men now, they may be unwilling to invest the time, money, and energy necessary to cope with a buyers' market. That's one reason why some manufacturers surveyed by ENR say they are taking a hard look at their distributor setups.

• **Mergers and giants**—Smaller manufacturers have another major worry these days—the growing merger trend, which is aimed toward developing complete lines of equipment. Right along with this is the expansion of big companies like General Motors Corp., and International Harvester Co. in the field. The smaller producer gets cold shudders when he considers the financial resources of such giants. What would happen to the equipment market for instance, if GM suddenly poured $10 million, $20 million, or even $50 million into its newly acquired Euclid Division to develop production facilities for some revolutionary type of equipment?

At any rate, there is no widespread dissatisfaction among contractors about the present state of product development in the industry. ENR's survey did find some criticism among contractors that manufacturers were not coming up fast enough with new ideas on heavy equipment. Concrete mixers, dozers, and shovels were mentioned as candidates for improvements or for adaptation to such special work as homebuilding. However, most contractors had no complaints about quality of equipment. There were some who complained that manufacturers are making too many small improvements, so that it was difficult to develop a uniform group of units of the same line.

There were some complaints about unsatisfactory service from distributors on parts, and about sloppy installation of parts. A few contractors growled about situations where a new part was neded on a rush job, the part was obtained, and a few hours later the machine was shut down again because of faulty installation.

• **Second-half outlook**—What is the outlook for sales in the second half? Most manufacturers whom ENR editors talked to believe they have seen the bottom for sales this year.

What about the possible effect of the new depreciation rules (ENR July 29, p. 91) on sales of equipment? Most manufacturers say they haven't studied the new rules closely enough yet to be able to make any estimates. However, one executive believes the new rules will be slow in having any effect. "About 5% of buyers," says he, "will be smart enough to start buying equipment right away on this basis. They'll work their new equipment hard. But most buyers will take a long time to change their habits."

• **Long-range look** – Although the equipment business is in a buyers' market this year, manufacturers are selling a tremendous amount of machinery. And the longer-range outlook for sales is optimistic.

This year's volume of construction financing, and the size of ENR's backlog, indicate that much more construction is coming up over the next year or so. And that means a continuing high volume of sales. For, buyers' market or not, equipment wears out when it is used long enough. High construction volume means high replacement volume.

"Let's put it this way," says Harold Hess, executive vice-president of the Construction Industry Manufacturers Assn. "It takes about $10 billion worth of equipment to handle the volume of construction we had in 1953. So we'll need from $1 billion to $1½ billion of new equipment each year to keep up the 1953 pace."

FHA tightens rules, lowers rates

As part of its series of new regulations spelling out provisions of the new housing law, the Federal Housing Administration has issued new rules to eliminate windfall profits on apartment rental projects. The new rules are on multi-unit rental housing developments whose mortgages are insured by FHA under Section 207.

FHA will insure mortgages in advance on these projects for 80% of estimated value. But after completing the apartment projects, the builders must certify their actual cost, and the mortgage will be readjusted to 80% of this actual value.

To stimulate construction of low-cost apartments, FHA will insure mortgages up to 90% of value where apartments cost not more than $7,200 per two-bedroom unit.

In order to meet protests of hotel owners that operators of some apartment projects were taking in transients, the regulations also prohibit use of government-insured projects as hotels.

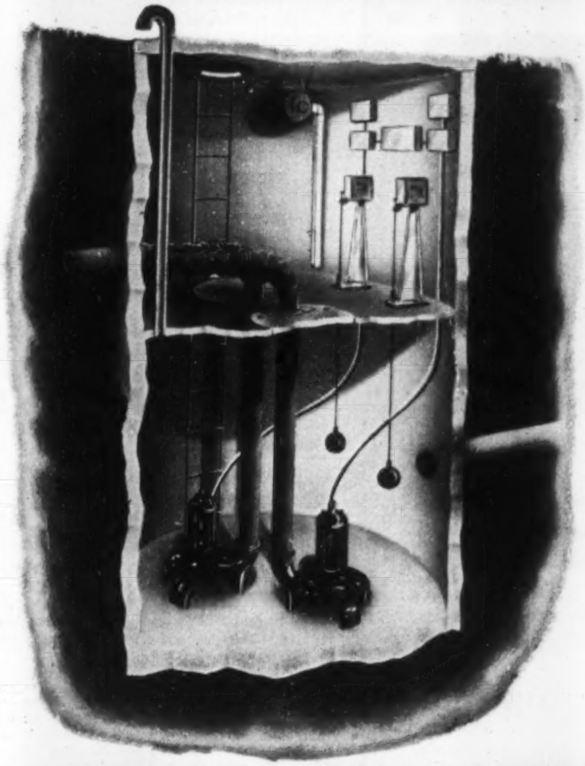
FHA also has cut the premium it charges lenders for insuring Title I home-modernization loans. Ever since the program started in 1939, FHA has been charging ¾% annually on the original face value of the loan. Now the charge has been cut to .65% on most loans, and .45% on a few particularly good risks, to take effect Oct. 1.

FHA's move was undoubtedly suggested by a study issued in the preceding week by the American Bankers Assn., which indicated that many banks could save substantial amounts by running their own home-modernization loan programs without FHA loan insurance (ENR Aug. 26, p. 64).

In making the reduction, FHA noted that gross claims it has paid under the insurance program have amounted to only about 2% of the net proceeds from its insurance premiums. Actual losses have been reduced to less than 1% by collection efforts.

(*B & F continued on page* 118)

The SUBMERSIBLE SEWAGE EJECTOR



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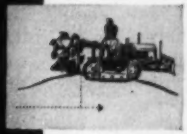

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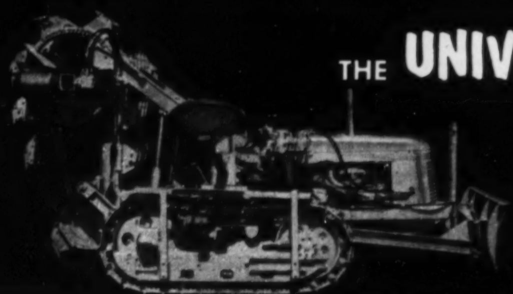

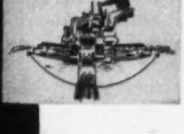

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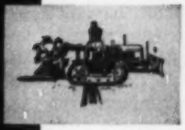

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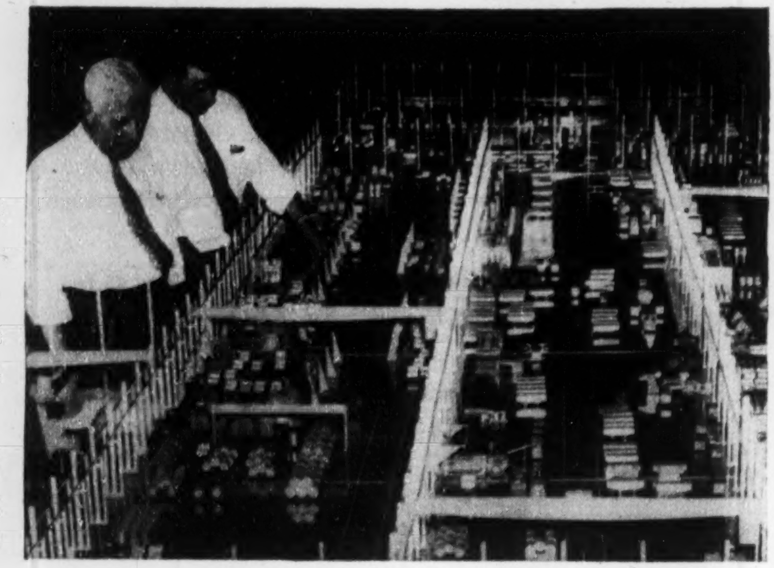


MILL MODEL—Project engineers study scale layout model of Kaiser Aluminum's proposed sheet and foil rolling mill, to be started soon near Ravenswood, West Va.

Kaiser Aluminum plans another big mill

Kaiser Aluminum & Chemical Corp. will build a big aluminum sheet and foil rolling mill on the Ohio River near Ravenswood, W. Va., about 50 mi north of Charleston. Actual construction will start about Jan. 1, with design, engineering, and construction to be supervised by Kaiser Engineers, a divsion of Henry J. Kaiser Co.

The initial rolling mill, to be finished about mid-1956, will have an annual capacity of 72,000,000 lb of light-gage aluminum sheet and foil. The mill will be supplied with heavy-gage sheet from the Trentwood, Washington plant.

Later, the plant will be expanded into a full integrated mill with about 250,000,000 lb annual capacity, drawing its aluminum pig from Kaiser's New Orleans reduction plant. Aluminum sheet, of course, has many applications in building and in air conditioning and heating systems.

Cost figures on the plant haven't been announced. But it is known that the Office of Defense Mobilization has granted Kaiser a certificate of necessity for about $66 million.

D. A. Rhoades, vice president and general manager of Kaiser Aluminum, believes that the Ravenswood mill will draw aluminum fabricators into the Ohio Valley. This is Kaiser's first sheet and foil mill in the eastern part of the U.S., other mills being located on the West Coast. It has a plant at Newark, Ohio, which turns out rods, bars, wire and electrical conductors, and an extrusion plant at Halethorpe, Md.

During the past three years, Kaiser has more than doubled its production capacity for primary aluminum through a $230 million capital spending program. When the second stage of the Ravenswood plant is completed in 1958, Kaiser will expand the plant further as demand for aluminum develops.

Contractor wins his case, lacked water-level data

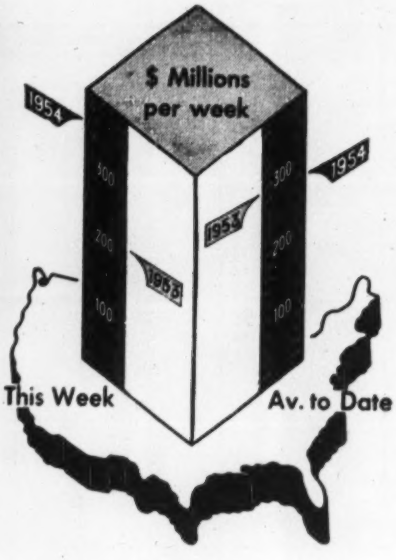
Henry R. Eitzen, North Hills, Pa., engineer and contractor, has just won a $30,656 verdict in county court at Norristown, Pa., against Springfield Township for added costs and expenses involved in construction of a sewage pumping station.

He told the court that drawings and specifications furnished by the township omitted water-level findings shown by test borings. The result, according to Eitzen, was that the job was flooded. He claimed that this would not have happened had he been given the water-level data before he started.

Sitting without a jury, County Judge William F. Dannehower ruled in favor of Eitzen.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 35 wks 1954	Cumulative 35 wks 1953	% chge
Federal	$26.2	$834.2	$1,065.2	—22
State and municipal	131.2	3,315.2	3,359.8	—1
Total public	157.4	4,149.4	4,425.0	—6
Total private	219.3	5,576.9	5,854.8	—5
U. S. total	$376.7	$9,726.3	$10,279.8	—5

Contracts by type of work

	This Week	1954	1953	% chge
Waterworks	$3.6	$153.5	$168.7	—9
Sewerage	8.3	254.9	274.5	—7
Bridges	14.1	335.6	444.8	—25
Highways	63.3	1,257.7	1,196.2	+5
Earthwork, waterways	9.1	189.5	282.5	—33
Buildings:				
Public, excl. hsg.	40.3	1,199.7	1,167.2	+3
Housg., public	1.0	165.5	312.8	—47
Housg., private	143.1	2,923.4	2,449.7	+19
Commercial	43.3	893.2	840.6	+6
Industrial	28.0	1,305.1	1,883.2	—31
Unclassified	22.6	1,048.2	1,259.6	—17
Total	$376.7	$9,726.3	$10,279.8	—5

NOTE: Minimum size projects included are: waterworks and waterways, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)

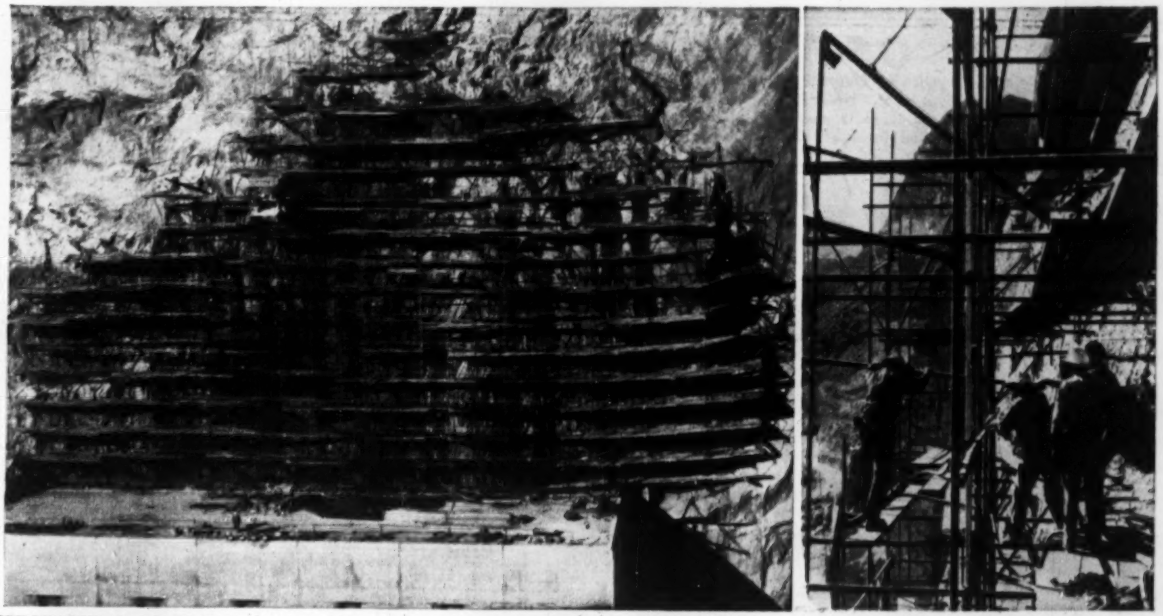
	Week of Aug. 26 1954	Cumulative 34 Wks 1954	% chge '53-'54
Corporate securities	$77.2	$2,028.0	—36
State and municipal:			
All except housing	52.0	3,567.7	+25
Housing	...	91.0	—57
Federal loans	0.3	78.3	—7
Federal aid	43.0	673.0	—12
Total non-federal	$172.6	$6,438.0	—9
Federal appropriation:			
In U. S.	$863.3	$2,073.3	+35
Outside U. S.	4.8	33.2	+15
Total new capital	$1,040.7	$8,544.5	—1

ENR cost and volume indexes, 1954

		Base years = 100 1913	1926	1949
Construction cost	8/26	640.06	307.68	134.18
	7/29†	642.05	308.63	134.60
Building cost	8/26	453.83	245.33	129.01
	7/29†	455.51	246.23	129.48
Volume	July	547	222	158
	June	510	207	147

† Official ENR monthly index for August

(*Advertisement*)



SPECTACULAR SCAFFOLDING—To safely anchor a huge rock slab, **overhanging the Nevada valve** house at Hoover Dam, Boulder City, Nev., men of Selby Drilling Co. worked from this immense "TubeLox" Steel Scaffold erected along the sheer canyon wall. "TubeLox" was used because it could be cantilevered inward, conforming to the contour of the massive 180 x 120 x 19 ft. slab. Safe support for the fourteen 7'6"-high platforms for drillers required an assembly using 11,000 lineal ft. of "TubeLox." Right: Men place one of the 349 2-in. dia. anchor bars, used to secure the slab to the canyon wall.

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SEARCHLIGHT SECTION

OFFICIAL PROPOSALS

Bids: September 14, 1954

Reconstruction of East End of the Brigantine Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE S4A (1927) ROUTE 87 (1953)

Reconstruction of the East End of the Brigantine Bridge over Absecon Channel on Route S4A (1927) Route 87 (1953), in the City of Atlantic City, County of Atlantic. The principal items of construction are:

Estimated:

	Bridge Items
339	cu. yds. Concrete in Structures
68,130	lbs. Reinforcement Steel in Structures
259,600	lbs. Structural Steel
4,445	lin. ft. Treated Timber Piles
20.17	M.B.M. Treated Timber
	Roadway Items
1,092	cu. yds. Roadway Excavation—Unclassified
500	cu. yds. Borrow Excavation
292	sq. yds. Macadam Base, 7" thick
282	sq. yds. Pavement Type MA-BC-2, 3" thick

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, September 14, 1954, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: September 14, 1954

Removal of Old Bridge Over Hackensack River

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE 25 (1927) ROUTE U. S. 1—TRUCK (1953)

Removal of Old Bridge over Hackensack River on Route 25 (1927) Route U. S. 1—Truck (1953), between Kearny and Jersey City, Hudsen County. The work to be performed includes the removal of eight steel truss spans each about 150 feet in length, the removal of one double leaf bascule span having a length of about 240 feet, the romval of ten (10) concrete piers, the removal of fender system, and incidental work. (LUMP SUM)

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, September 14, 1954, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500,000 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

(Continued on following page)

OFFICIAL PROPOSALS

***RATE:* The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.**

***CLOSING DATE:* Friday 10:30 A.M. for issue dated the following Thursday.**

***SEND COPY TO:* Official Proposal Division,**
Engineering News-Record
330 West 42nd Street
New York 36, N. Y.

(Continued from page 119)

Bids: September 16, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Canal Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 16th day of September 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Ronan, Acting District Engineer, 353 Broadway, Albany, N. Y.						
Albany	M.T 54-5	New York State Thruway-Mohawk Section-Subd. 2 (So. Schenectady Gas Station-Restaurant Site) (Type C)	....	Grading, Paving & Misc. Work	$9,500 Plans $10	$169,000
Albany	FAC 54-8	Albany City: Riverfront Arterial Highway (Cont. 1) Proj. U-712(5)	0.71	9″ Cem. Conc. Pavt. 2 @ 24′ Wide = 0.44 Mi. Misc. Work = 0.27 Mi.	70,000 Plans $15	1,297,000
Saratoga	G.P. 54-1	Geyser Park (State Reservation at Saratoga)	0.15	Found. Crse. Gravel R.C. Twin Closed Box Br. 30′	$1,300 Plans $10	24,000
Saratoga	T.C. 54-3	City of Mechanicville; Central Ave. (South St. to Frances St.) FAC 53-15	0.37	Traffic Signal System	$450 Plans $10	8,000
Washington	R.C. 54-96	Sandy Hill-Adamsville S.H. 720	....	48″ Corr. Metal Pipe Culvert	$600 Plans $10	11,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
Montgomery	M 54-5	Dam 6 and Lock 10 Bridge, Cranesville (B.C.)	....	Rehabilitation of Dam & Bridge (Cleaning and Painting)	$1,500 Plans $10	27,500
Montgomery	M.T. 54-4	New York State Thruway-Mohawk Section-Subd. 16 (Pattersonville Gas Station-Restaurant Site (Type B)	....	Grading, Paving & Misc. Work	$10,000 Plans $10	173,000
Montgomery	FASS 54-14	Fort Plain-St Johnsville (C.R. 65) Proj. S-420(1)	0.33	Asph. Conc. Opt. Pl. Girder Br. 4 Spans 3 @ 120′, 1@ 233′	$38,000 Plans $15	688,000
DISTRICT No. 3 William Robinson, District Engineer, Weigh Lock Bldg Syracuse, N. Y.						
Onondaga	FARC 54-97	Collamer Road, S.H. 348 Proj. F-U-994(4) Cont. 2	....	Installing Electric Lighting Facilities	$1,100 Plans $10	21,000
DISTRICT No. 4, E. G. H. Youngmann, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Orleans	FARC 54-100	Holley-Ridge Road, S.H. 582 Ridgeway-Gaines, Pt. 2 S.H. 8099 Proj. S-408(1); F-181(3)	0.84	Asp. Conc. Opt. = 0.23 M . 9″ Cem. Conc. Pavt. 20′-24′ Wide = 0.47 Mi. Misc. Work = 0.14 Mi. Comp. I-Beam Br. 162′ I-Beam Br. 42.6′	$21,000 Plans $15	388,000
DISTRICT No. 5, C. R. Waters, District Engineer, State Office Building, Buffalo, N. Y.						
Erie	GISP 54-3	Grand Island State Parkway (Access Road to Beaver Island State Park)	0.50	Asp. Conc. Opt. = 0.40 Mi. Pedestrian Path and Misc. Work = 0.10 Mi. Comp. I-Beam Br. 45′ Comp. I-Beam Pedest. Br. 45′	$11,000 Plans $15	205,000
Erie	FASS 54-15	Genesee Road, C. R. 448 Proj. S-295(1)	0.73	Bit. D.S.T. Graded Gravel R.C. Arch Br. 20.4′	$11,000 Plans $10	206,000
DISTRICT No. 8, J. S. Bixby, District Engineer Pleasant Valley Road, Poughkeepsie, N. Y.						
Putnam	TSP 54-4	Taconic State Parkway Sect 3	0.81	Asp. Conc. Opt.	$1,400 Plans $10	25,000
Westchester	R.C. 54-98	Yonkers-White Plains S.H. 5231	0.57	Storm Drain System	$3,700 Plans $10	67,000
Westchester	TSP 54-2	Taconic State Parkway (Hawthorne Traffic Circle)	....	Installing Electrical Lighting Facilities	$700 Plans $10	12,000
DISTRICT No. 9 F. W. Donovan, Dist. Engr. 71 Frederick St., Binghamton N. Y.						
Broome	FGC 54-12	City of Binghamton: Court Street Arterial Highway (Erie & D.L.&W.R.R. Brs.) Proj. UG-344(20)	0.17	Asp. Conc. Opt. R.R. Sep. Plate Girder 77.3′ R.R. Sep. Plate Girder 98.3′	$50,000 Plans $15	881,000
Chenango	FAC 54-13	City of Norwich-North Broad St. Proj. U878(2)	0.73	Asp. Conc. Opt.	$16,000 Plans $10	295,000
Sullivan	FARC 54-101	Bloomingburg-Monticello, Pt 2 & Pt. 1, SH 5457-5510-5510A Port Jervis-Wurtsboro, Pt. 2 SH 8287 Proj. F-FG 495(7)	10.63	Fdn. Crse. Grav. = 9.73 Mi. Asp. Conc. Opt. = 0.27 Mi. 9″ Cem. Conc. Pavt. 24′ Wide = 0.32 Mi. Misc. Work = 0.31 Mi. 2 Hy. Seps. Comp. I-Beam 219.6′ and 273.4′ 1 Br. Twin Conc. Box 30′ 1 RR Sep. Conc. Box 25′	$450,000 Plans $50	8,342,000
DISTRICT No. 10, M. E. Goul, Dist. Engr., Montauk Hwy. at Little E. Neck Rd., Babylon, L. I., N. Y.						
Kings	FA BQE54-1	Brooklyn-Queens Expressway Contract 7A Proj. U-1066(15)	1.29	9″ Col. Cem. Conc. Pavt. Var. Wide. = 0.30 Mi. 9″ Cem. Conc. Pavt. = 0.04 Mi. Sheet Asp. Pavt. = 0.57 Mi. Granite Block Pvt. = 0.30 Mi. Misc. Work = 0.08 Mi. 2 Hy. Seps. Steel Stringers 95.1′ & 67.8′	$166,000 Plans $50	3,022,000
Kings	FA BQE54-2	Brooklyn-Queens Expressway Proj. U-1066(14) Cont. 6A	Hy. = 0.28 Acc. = 0.25	9″ Col. Cem. Conc. Pavt. Var. Wide = 0.19 Mi. Sheet Asp. Pavt. = 0.25 Mi. Misc. Work = 0.09 Mi.	$52,000 Plans $50	963,000
Queens	FA GC54-1 FA VWE54-1	Grand Central Parkway Extension Van Wyck Expressway Proj. U741(22), U658(21), U1085(16)	4.37	Miscellaneous work	$9,500 Plans $15	170,000
Nassau	BP54-51 Pt. 2	Atlantic Beach Park District (Genesee Ave. & 6th St.)	....	Beach Protection 4 Stone Groins	5% of Bid Plans $10	710,400

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

Bids: September 22, 1954

Indiana Toll Road Commission

309 W. Washington Street
Old Trails Building
Indianapolis, Indiana

NOTICE TO BIDDERS

Contract C-48
Contract C-49
Contract C-50
Contract C-48 and C-49
Contract C-49 and C-50
Contract C-48, C-49 and C-50

Sealed proposals will be received by the Indiana Toll Road Commission at or before 10:00 A.M., Central Standard Time, September 22, 1954 for the performance of each of the contracts enumerated above.

Contract No. C-48

The grading, drainage, structures and paving of approximately 4.0 miles in Construction Section C-48 of the Indiana East-West Toll Road beginning at the Fawn River at Toll Road Centerline Station 7155+45 in LaGrange County and extending eastwardly to a point about 600 feet west of a County Road at Toll Road Centerline Station 7364+00 in Steuben County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation	308,000 cu. yds.
Borrow	220,000 cu. yds.
10" Reinforced Concrete Pavement	110,500 sq. yds.
Culvert Pipes and Underdrains	3,500 lin. ft.
Cast-in-Place Concrete Piling	3,900 lin. ft.
Concrete for Structures	1,750 cu. yds.
Reinforcing Steel	203,000 lbs.
Fabricated Structural Steel	531,000 lbs.

Contract No. C-49

The grading, drainage, structures and paving of approximately 5.1 miles in Construction Section C-49 of the Indiana East-West Toll Road beginning at a point about 600 feet west of a County Road at Toll Road Centerline Station 7364+00 in Steuben County and extending eastwardly to a point about 2,300 feet west of a County Road at Toll Road Centerline Station 7634+00 in Steuben County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation	522,000 cu. yds.
Borrow	211,000 cu. yds.
10" Reinforced Concrete Pavement	143,000 sq. yds.
Culvert Pipes and Underdrains	5,000 lin. ft.
Cast-in-Place Concrete Piling	3,650 lin. ft.
Concrete for Structures	2,300 cu. yds.
Reinforcing Steel	313,000 lbs.
Fabricated Structural Steel	570,000 lbs.

Contract No. C-50

The grading, drainage, structures and paving of approximately 4.0 miles in Construction Section C-50 of the Indiana East-West Toll Road beginning at a point about 2,300 feet west of a County Road at Toll Road Centerline Station 7634+00 in Steuben County and extending eastwardly to a point about 4,300 feet east of U.S. Route 27 at Toll Road Centerline Station 7847+00 in Steuben County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation	1,290,000 cu. yds.
10" Reinforced Concrete Pavement	132,000 sq. yds.
Culvert Pipes and Underdrains	7,500 lin. ft.
Cast-in-Place Concrete Piling	4,620 lin. ft.
Concrete for Structures	4,800 cu. yds.
Reinforcing Steel	707,000 lbs.
Fabricated Structural Steel	900,000 lbs.

The work covered by Contracts C-48, C-49 and C-50, which covers a combination of Construction Sections C-48 and C-49, C-49 and C-50, C-48, C-49 and C-50, is the construction as above described for the individual Construction Sections, taken together.

Copies of the Plans, Specifications and Proposal Forms for said Contracts are available for public inspection or purchase at the office of the Chief Engineer, Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for the Indiana East-West Toll Road	$ 5.00
Plans, Special Provision and Proposal Forms, per set, per Construction Section	$25.00
Informational Drawings	
Cross-Sections, per set, per Construction Section	$25.00
Soil Plan and Profiles, per set, per Construction Section	$ 5.00

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Contractor's statement for qualification on the forms supplied by the Commission will be required from all Bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5%) per cent of the total price bid per Construction Section covered by the Contract. If the Bidder shall tender bids for two or more Contracts which include the same Construction Section, the Construction Section thus duplicated in the bidding need be counted only once in determining the total amount of the Proposal Guaranty. The Proposal Guaranty shall be in the form of an acceptable surety bond or a certified check on a solvent bank.

If the Bidder is an out of state corporation, he shall be required to furnish a certificate from the Secretary of State of Indiana as evidence that the corporation has complied with the Indiana Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Indiana.

All bids must be received at or before 10:00 A.M. Central Standard Time, September 22, 1954, in the offices of the Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. At said hour, the bid box will be publicly opened and the bids read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

INDIANA TOLL ROAD COMMISSION
Dr. Dillon Geiger Chairman
Charles W. Keating Secretary-Treasurer

Bids: September 28, 1954

Construction of Incinerating Plant

CITY OF ALEXANDRIA, VIRGINIA
REFUSE INCINERATING PLANT
NOTICE TO BIDDERS

Sealed proposals will be received by the City of Alexandria, Virginia, at the office of the City Purchasing Agent until 2:00 P.M., September 28, 1954, at which time they will be publicly opened and read and contracts awarded as soon thereafter as practicable, for the construction of a Refuse Incinerating Plant, to be located at Payne and Jefferson Streets, in the City of Alexandria, Virginia.

The work is divided into three Contracts. Each bidder may submit a proposal for any Contract, for all Contracts, or for any combination of Contracts.

Contract A—Building, comprises the construction of the incinerating plant building, of reinforced concrete, structural steel and masonry, including all work not specifically included in other Contracts.

Contract B—Furnaces and appurtenances, comprises the construction of the incinerating furnaces, combustion chambers, subsidence chambers, flues, forced draft equipment and other appurtenant work.

Contract C—Chimney, comprises the construction of a radial brick chimney with firebrick lining, above the concrete foundation.

The Instructions to Bidders, Proposal, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City Purchasing Agent, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set. The amount of the deposit will be refunded if the documents are returned in good condition within 30 days after the opening of bids.

Each proposal must be accompanied by money or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, in an amount not less than five per cent (5%) of the total bid.

Bidders must be registered as Contractors in the Commonwealth of Virginia as required under Chapter 7, Title 54, of the Code of Virginia of 1950.

The City reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the City after all bids have been examined and canvassed.

City of Alexandria, Virginia
(Signed) W. M. TOPPING
Purchasing Agent
Dated: August 25, 1954
Alexandria, Virginia

Bids: September 13, 1954

The Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR
THE FABRICATION & ERECTION OF THE SUPERSTRUCTURE AND FLOATING SUPPORTS
OF A
TEMPORARY STEEL TRUSS, FLOATING BRIDGE
CONNECTING HAWKINS POINT TO BARNHART ISLAND
OVER ST. LAWRENCE RIVER
NEAR MASSENA, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATIONS NO. 5425-A
ST. LAWRENCE CONTRACT NO. 2

NOTICE TO CONTRACTORS: THE POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the fabrication and erection of a temporary steel truss, floating bridge connecting Hawkins Point to Barnhart Island over St. Lawrence River, near Massena, St. Lawrence County, New York, until 10:30 A.M. Eastern Standard Time on the 13th day of September, 1954 at 270 Broadway, Room 1207A, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

Plans, specifications and Proposal Forms for the work are on file in the Authority's Office and in the offices of the Engineers, Praeger-Kavanagh, 126 East 38 Street, New York, New York; The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and Proposal Forms may be obtained from The Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, after August 23, 1954 upon application and payment of a fee of Thirty ($30.00) dollars per set, plus mailing costs, no part of which will be refunded.

Bids must be made upon the proposal forms included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of The Power Authority of the State of New York for the sum of $25,000.00.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: September 9, 1954

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Time, on September 9, 1954 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, NEW ENGLAND SECTION, NEW ROCHELLE TO CONNECTICUT STATE LINE, WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-70

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.
(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $21,550.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1078.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. Tallamy
SUPERINTENDENT OF PUBLIC WORKS

Bids: September 23, 1954

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a.m., Eastern Daylight Saving Time, the 23rd day of September 1954, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

For the construction of structures and grading, drainage and paving of the Turnpike Section 36-B, part of the Northeastern Extension of the Pennsylvania Turnpike in North Whitehall and South Whitehall Townships, Lehigh County, Commonwealth of Pennsylvania, this section being situated as follows:

Beginning at a point approximately 590 lin. ft. southeast of the centerline of the presently existing Catasaqua Branch of the Reading Railroad at Turnpike station 670+00 in South Whitehall Township, Lehigh County; thence in a northwesterly direction 22,150 lin. feet, to Turnpike station 891+99.62, to a point approximately 2023 lin. feet northwest of the centerline of Legislative Route 39049 in North Whitehall Township, Lehigh County, a distance of approximately 4.195 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation	1,244,995 cu. yds.
Class 2 Excavation	19,890 cu. yds.
Class 2-A Excavation	5,445 cu. yds.
Special Subgrade	180,444 sq. yds.
Reinforced Concrete Pavement	114,934 sq. yds.
Class A Concrete	3,417 cu. yds.
Class B Concrete	5,433 cu. yds.
Plain Steel Bars	804,176 lbs.
Fabricated Structural Steel	1,839,400 lbs.
Median Divider	20,723 lin. ft.

For the construction of structures and the grading, drainage and paving of the Turnpike Section 36-C, part of the Northeastern Extension of the Pennsylvania Turnpike in North Whitehall and Washington Townships, Lehigh County, Commonwealth of Pennsylvania, this section being situated as follows:

Beginning at a point approximately 3432 lin. feet southeast of the centerline of Legislative Route 39091 at Turnpike station 891+50 in North Whitehall Township, Lehigh County; thence in a northwesterly direction approximately 26,468 lin. feet, to Turnpike station 1156+18.3 at a point approximately 3493 lin. feet northwest of the centerline of existing Legislative Route 163 in Washington Township, Lehigh County, a distance of approximately 5.01 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation	1,324,853 cu. yds.
Class 2 Excavation	15,231 cu. yds.
Class 2A Excavation	5,678 cu. yds.
Special Subgrade	217,373 sq. yds.
Reinforced Concrete Pavement	138,663 sq. yds.
Class A Concrete	3,989 cu. yds.
Class B Concrete	5,782 cu. yds.
Plain Steel Bars	866,125 lbs.
Fabricated Structural Steel	755,500 lbs.
Median Divider	25,275 lin. ft.

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on September 7, 1954. Plans, specifications, cross-sections and other contract documents will be available by this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) dollars per set, for each section.

Plans and contract documents, for each section exclusive of cross-sections and specifications, may be purchased from the Pennsylvania Turnpike Commission for the sum of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

The Pennsylvania Turnpike Commission reserves the right to award each section as a separate contract or in a combined contract.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
24 August 1954

Bids: September 21, 1954

Board of Water Supply Contract 419

HEATING AND VENTILATING EQUIPMENT

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M. Eastern Standard Time, (11:00 A.M., Eastern Daylight Saving Time), on Tuesday, September 21, 1954, for Contract 419, for furnishing, delivering, installing and testing heating, ventilating and appurtenant equipment for the Neversink intake chamber, located in the Town of Neversink, Sullivan County, New York, and the East Delaware intake and Downsville release water chambers, located in the Town of Colchester, Delaware County, New York, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of ten thousand dollars ($10,000.00), for the proper execution of the Contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1316, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: September 9, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 9th day of September 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following project: in Oneida County, L. Ketchum, Dist. Engr., 109 No. Genesee St., Utica, N. Y.:

Contract No.	Type	Name of highway and miles	Deposit for plans	Bid deposit	Dept. est.
RC(MT) 54-99	Asp. Conc. Opt. 4 Sp. I-Beam Hy.Sep. 145'	Utica-Maynard, SH 1517 (Temporary Grade Sep. with N.Y.S. Thruway-Mohawk Sect.-Sub. 9) 0.18 Mile	$10	$4,500	$81,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department

of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, simliar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each poropsal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: September 23, 1954

Construction of Water System

WOODBOURNE WATER DISTRICT TOWN OF FALLSBURGH, N. Y.

1. Sealed proposals for Contracts I, II, III, and IV for construction of a water system in the Woodbourne Water District will be received by the Town Board, Town of Fallsburgh, Sullivan County, New York until 2:00 p.m., E.D.S.T., September 23, 1954, in the Town Clerk's Office at South Fallsburgh, and there publicly opened and read immediately thereafter.
2. The work of the various contracts is as follows—Contract I, constructing test wells, 2 permanent wells with pumps and motors; Contract II, constructing 2 well houses, standpipe foundation, and electrical work; Contract III, constructing 350,000 gallon steel standpipe; Contract IV, constructing 23,000 lin. ft. of 6", 8" and 10" mains with hydrants, valves and house services.
3. Plans, specifications, bidding and contract documents may be examined at the Town Clerk's Office and at the office of the Consulting Engineers, Alexander Potter Associates, 50 Church St., New York 7, N. Y., and there be obtained upon a deposit of ten (10) dollars per set.
4. Full refund will be made to actual bidders for return of one (1) set, in good condition, within two weeks after the closing date for receipt of bids; refund for return of all other sets in good condition, by actual bidders, within the same period, will be fifty (50) percent of the deposit.
5. All proposals must be on the form contained in the specifications.
6. All bids must be accompanied by a certified check in the amount of ten (10) percent of the amount of the bid, made payable to the Town of Fallsburgh. Said checks will be refunded to all, except the two (2) lowest bidders, not later than ten (10) days after opening of bids.
7. The successful bidder will be required to furnish a Performance Bond conditioned upon the faithful performance of the contract and upon the payment of all persons supplying labor and furnishing materials on the construction of the work.
8. No bidder may withdraw his bid within thirty (30) days atfer closing date for receipt of bids.
9. The Town Board reserves the right to reject any oral bids and to waive any informality in the bid, and to accept that proposal which, in its judgment, best serves the interests of the Water District.

Woodbourne Water District
Town of Fallsburgh, N. Y.
By: Mortimer Michaels, Supervisor.

Read the Official
Proposal Columns of
ENGINEERING NEWS-RECORD
This Week and Every Week

Bids: September 8, 1954

Indiana Toll Road

INDIANA TOLL ROAD COMMISSION
309 W. Washington Street
Old Trails Building
Indianapolis, Indiana

NOTICE TO BIDDERS
Contract C-51
Contract C-52
Contract C-53
Contract C-51 and C-52
Contract C-52 and C-53
Contract C-51, C-52 and C-53

Sealed proposals will be received by the Indiana Toll Road Commission at or before 10:00 A.M., Central Standard Time, September 8, 1954 for the performance of each of the contracts enumerated above.

Contract No. C-51

The grading, drainage, structures and paving for approximately 3.2 miles in Construction Section C-51 of the Indiana East-West Toll Road beginning at a point about 4,555 feet northwest of the intersection of the Toll Road Centerline and State Route 120 at Toll Road Centerline Station 7847+00 in Steuben County and extending easterly and southeasterly to a point about 879 feet southeast of the intersection of the Toll Road Centerline and State Route 827 at Toll Road Centerline Station 8014+00 in Steuben County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation.	865,000 Cubic Yards
Borrow	348,000 Cubic Yards
10" Reinforced Concrete Pavement...	91,600 Square Yards
Culvert Pipes and Underdrains	10,480 Lineal Feet
Cast-in-Place Concrete Piling	8,700 Lineal Feet
Concrete for Structures	4,660 Cubic Yards
Reinforcing Steel....	637,300 Pounds
Fabricated Structural Steel	1,061,300 Pounds

Contract C-52

The grading, drainage, structures and paving for approximately 4.1 miles in Construction Section C-52 of the Indiana East-West Toll Roard beginning at a point about 879 feet southeast of the intersection of the Toll Road Centerline and State Route 827 at Toll Road Centerline Station 8014+00 in Steuben County and extending southeasterly to a point about 4,600 feet northwest of the intersection of the Toll Road Centerline and Burch Road at Toll Road Centerline Station 8232+00 in Steuben County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation.	589,000 Cubic Yards
10" Reinforced Concrete Pavement...	116,200 Square Yards
Culvert Pipes and Underdrains	12,920 Lineal Feet
Cast-in-Place Concrete Piling.......	8,000 Lineal Feet
Concrete for Structures	3,210 Cubic Yards
Reinforcing Steel....	484,400 Pounds
Fabricated Structural Steel........	1,139,000 Pounds

Contract No. C-53

The grading, drainage, structures and paving for approximately 5.1 miles in Construction Section C-53 of the Indiana East-West Toll Road beginning at a point about 4,600 feet northwest of the intersection of the Toll Road Centerline and Burch Road at Toll Road Station 8232+00 in Steuben County and extending southeasterly and easterly to a point in the Indiana-Ohio State line about 3,668 feet east of the intersection of the Toll Road Centerline and U. S. Route 20 at Toll Road Station 8500+00 in Steuben County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation.	1,076,000 Cubic Yards
Borrow	8,000 Cubic Yards
10" Reinforced Concrete Pavement...	142,300 Square Yards
Culvert Pipes and Underdrains	28,290 Lineal Feet
Cast-in-Place Concrete Piling.......	14,400 Lineal Feet
Concrete for Structures	7,370 Cubic Yards
Reinforcing Steel....	1,218,500 Pounds
Fabricated Structural Steel........	2,049,000 Pounds

The work covered by Contract C-51, C-52 and C-53, which covers a combination of Construction Sections C-51 and C-52, C-52 and C-53, C-51, C-52 and C-53, is the construction as above described for the individual Construction Sections, taken together.

Copies of the Plans, Specifications and Proposal Forms for said Contracts are available for public inspection or purchase at the office of the Chief Engineer, Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for the Indiana East-West Toll Road.	$ 5.00
Plans, Special Provisions and Proposal Forms, per set, per Construction Section	$25.00
Informational Drawings	
Cross-Sections, per set, per Construction Section	$25.00
Soil Plan and Profiles, per set, per Construction Section......	$ 5.00

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Contractor's statement for qualification on the forms supplied by the Commission will be required from all Bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5%) percent of the total price bid per Construction Section covered by the Contract. If the Bidder shall tender bids for two or more Contracts which include the same Construction Section, the Construction Section thus duplicated in the bidding need be counted only once in determining the total amount of the Proposal Guaranty. The Proposal Guaranty shall be in the form of an acceptable surety bond or a certified check on a solvent bank.

If the Bidder is an out of state corporation, he shall be required to furnish a certificate from the Secretary of State of Indiana as evidence that the corporation has complied with the Indiana Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Indiana.

All bids must be received at or before 10:00 A.M., Central Standard Time, September 8, 1954, in the offices of the Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. At said hour, the bid box will be publicly opened and the bids read.

The award of any of the above-enumerated Contracts if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

INDIANA TOLL ROAD COMMISSION
Charles W. Keating — Dr. Dillon Geiger
Secretary-Treasure — Chairman

Bids: September 14, 1954

Route 42, Section 3D, and Route 45, Section 27A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON
READVERTISEMENT

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route 42, Section 3D, from 11th Avenue to 4th Avenue, Gloucester Township, Camden County, and Route 45, Section 27A, from Marlton Avenue to Grant Street, Borough of Woodstown, Salem County; Drainage Improvements. Length 0.650 mile. The principal items of work are:

Estimated:
384 sq. yds. Pavement Excavation
579 cu. yds. Ditch Excavation
1,500 sq. yds. Macadam Base Course, 6" thick
1,500 sq. yds. Pen. Macadam Surface, 3" thick
30 tons Pavement Type SM, 2" thick
306 lin. ft. Corrugated Metal Pipe
2,872 lin. ft. Reinforced Concrete Pipe
36—Inlets and Manholes

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, September 14, 1954, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: September 14, 1954

Palisades Interstate Parkway, Sec. I-K—Planting

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Palisades Interstate Parkway, Section 1-K, from Sta. 319+00 N.B. to Sta. 407+00 N.B.—Planting, Borough of Alpine, Bergen County. Length 1.666 miles. The principal items of work are:

Estimated:
127 Trees—Deciduous
323 Trees—Evergreen
594 Trees—Small & Flowering
8,938, Shrubs
1,510 Vines
700 cu. yds. Topsoil

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, September 14, 1954, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

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The advertising rate $20.50 per inch for all advertising appearing on other than a contract basis. Contract rate quoted on request.

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SEND NEW ADVERTISEMENTS to N. Y. office, 330 W. 42nd St., N. Y. 36, for September 16th issue, closing September 3rd

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

CLERK OF the Works. Heavy experience in large building projects to serve as Resident Engineer on construction of High School starting September. Send resume of education, experience and salary expected to Herman J. Connors, Business Manager, Board of Education, Passaic, New Jersey.

LARGE EASTERN contracting company engaged in heavy construction desires man to fill position as superintendent of equipment maintenance. Position permanent for right man. Include education, experience, references, and salary expected in application letter. Reply P-3556, Engineering News-Record.

CHIEF ESTIMATOR, General Contractor operating in South and Midwest desires experienced building estimator. Excellent opportunity for man able to accept full responsibility with aggressive, growing concern. Reply fully, stating experience, personal data and salary requirements to Blount Brothers Construction Company, P O Box 1144, Montgomery, Alabama.

ESTIMATING OPPORTUNITY—Recent graduate with some field experience on commercial and industrial building for quality surveys. Opportunity for man interested in estimating with well established firm, headquarters Central Illinois. State qualifications & salary expected. P-3549, Engineering News-Record.

CIVIL, HIGHWAY, Drainage and Bridges Engineers, Designers, Specification Writers, Cost Estimators, Draftsman, and Surveyors for Permanent assignment on Airport, Highway, Expressway and Bridge Projects. Location East and Southeast States. An opportunity for producers of quality work. Submit resume, age, education, experience, title and duties, references, salary required, and availability. P-3593, Engineering News-Record.

EXPERIENCED STRUCTURAL Engineers. Highway Bridge design up-state New York area include education, experience and salary expected in application. P-3655, Engineering News-Record.

CIVIL ENGINEER, youthful. Service Discharge, estimating, layout, direct work crews efficiently for underground City Public Utility Lines and structures, roads and related activities. C. P. Ward, Inc., 700 Hollenbeck Street, Rochester 21, New York.

SURVEYOR LICENSED NYS. Charge of LI office 10 yrs title survey exp. Open. Future Empl. Agy., 241 Sunrise Hway, Rockville Centre, N. Y.

WANTED—timekeeper with contracting firm located in Scarsdale, New York. Must have accounting experience. Give age, experience, and salary expected. Frank Bracalello, Inc., Scarsdale, New York.

WANTED: AN engineer qualified to design, make shop drawings and bills of material for water treatment plants. Location, Ames, Iowa. Salary $4,800.00. State experience in first reply. General Filter Company.

ENGINEER: ORGANIZE and supervise estimating and cost accounting department. Must have broad and heavy construction experience, background in preparing bidding estimates and in cost keeping work. Permanent job with nationally known firm in Southwest. Man between 40 and 50 preferred. Replies should give personal information, work history, and references. Write Box P-3692, Engineering News-Record.

ENGINEER—CIVIL. Municipality near NYC has permanent opening for City Engineer. Must have NYS Professional Engineer's License and be capable of directing the operations of the Department of Public Works and the Sewage and Water Plants. Salary $7,500 plus. Send complete details of experience to Box P-3781, Engineering News-Record. All replies will be acknowledged.

ENGINEERS

Highway and Bridge Designers, draftsmen, survey and supervision of construction personnel. Large highway and bridge contracts, eastern United States. Submit resume.

P-3749, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

SALARIED POSITIONS $5,000 — $35,000

We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc.
659 Brisbane Bldg. **Buffalo 3, N. Y.**

POSITIONS VACANT

SUPERINTENDENT OF Public Works. In March 1955, the Town of Wellesley, Mass. will combine several Departments to form a new Public Works Department. A position as Superintendent will then be open. Those interested in making application for this position should write details of training, experience and salary required to the address below. A detailed prospectus of the position will be sent to such applicants. Address: J. Austin Peckham, 23 Central St., Wellesley 81, Mass.

CONTROLLER FOR General Contractor in Northern Ohio area. C.P.A. or equivalent with construction experience. Present volume fifteen million dollars. P-3794, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER — Rochester, New York and Pittsburgh, Pennsylvania territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions are permanent and offer excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-2289, Engineering News-Record.

EMPLOYMENT SERVICES

OVERSEAS PROJECTS Guide to most active construction-engineers, oil co's., gv't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

STRUCTURAL DESIGNER, age 36, BS & MS Degrees, 8 years office experience in miscellaneous building design. Can supervise design groups. Will locate anywhere in U.S. PW-3768, Engineering News-Record.

EXPERIENCED CONSTRUCTION Superintendent wants job. Location immaterial. PW-3532, Engineering News-Record.

CONSTRUCTION EXECUTIVE, long New York experience buildings and heavy construction, available for new connection as Project Manager on large operation or as Contractor's executive, where scope will permit full use of ability. Inquiries solicited from contractors requiring top man, qualified to handle all phases, bid to completion. New York area preferred. PW-3661, Engineering News-Record.

(Continued on opposite page)

ESTIMATOR WANTED

Commercial and Industrial Construction

Graduate Engineer not over 40 years old. Must be thoroughly experienced in cost analysis and project planning. Unusual opportunity for an unusual young man to associate himself with 35-year old successful Engineering and Construction organization with principal offices in Pittsburgh, Pennsylvania. Compensation commensurate with ability. Splendid opportunity for advancement to top executive position. We are interested only in those meeting the above requiremnts.

P-3575, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Foreign Service

Graduate Chemical, Mechanical. Electrical & Construction Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of construction, estimating materials and cost control, planning and refinery process work. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30

Arabian American Oil Company

505 Park Avenue, New York 22, N. Y.

SOUTH AMERICAN POSITIONS

MILL METALLURGIST for large copper concentrator, to work directly under Asst. Superintendent and be in full charge of all testing and research.

YOUNG CIVIL ENGINEERING GRADUATE with some experience in maintenance of track and track equipment for Railroad Department.

ASSISTANT RAILROAD SUPERINTENDENT for operation and maintenance of 44 miles of thirty-inch gauge main line track, diesel electric locomotives, etc.

SMELTER SUPERINTENDENT, graduate Metallurgical or Chemical Engineer, with experience smelter operation and maintenance. Design or construction would be valuable.

GRADUATE MECHANICAL ENGINEER with several years experience in actual supervision of large shops comprising Machine Shops, Plate & Welding Shops, Iron, Steel and Brass Foundries.

Large Copper Company Chile, South America. 3-year contract. Transportation both ways and salary while traveling paid by Company. Good opportunities. In reply give complete details.

P-3739, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

Designing engineers, highways-thruways, bridges, airfields, drainage, sanitation, hydraulic, soil mechanics, structural.

Draftsmen, designers, to Project Manager.

Submit resume

SEELYE STEVENSON VALUE & KNECHT
101 Park Ave. **New York 17, N. Y.**

DESIGNING ENGINEER

Well-established manufacturer needs first-class engineer to design and improve construction machinery.

Excellent salary — Good future.

SALES ENGINEERS

Also need two or more experienced sales engineers familiar with heavy construction; one for Midwest and one for Pacific Coast.

P-3776, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

(Continued from opposite page)

ELECTRICAL ENGINEER, age 36, 17 years electrical design & specifications for hospitals, public bldgs., schools, industrial & chemical plants and power plants. Also considerable airport design experience. Familiar all phases of the electrical construction industry. Capable of taking complete charge. Has architect following. Willing to relocate, PW-3705, Engineering News-Record.

CIVIL GRADUATE 28 years structural design detail and fabrication. Familiar with weldments and rigid frames. Open for responsible position with fabricator. PW-3680, 520 N. Michigan Ave., Chicago 11, Ill.

BRIDGE SUPERINTENDENT or Carpenter foreman, 28 years experience, sober, cost conscious, good organizer, hard pusher, Eastern states preferred. Available now. PW-3517, Engineering News-Record.

MANAGER EXECUTIVE 15 years experience in engineering and construction. Broad knowledge of foreign and domestic work. Graduate engineer. PW-3656, Engineering News-Record.

PURCHASING AGENT, 20 years commercial, industrial & heavy construction experience including accounting, material handling and control, expediting. PW-3677, Engineering News-Record.

HAVE MUCH to offer contractors in heavy construction field as top flight supervisor. Age 42. Reply PW-3709, Engineering News-Record.

SALES EXPERIENCE thru the 30's. Heavy construction management to this date. Wish to return to equipment sales again with sales management eventually in mind. Lots of experience, still young. PW-3716, Engineering News-Record.

CONSTRUCTION FOREMAN or Supt. experienced in all kinds of construction work. Buildings, roads, bridges etc. 25 years experience. PW-3666, Engineering News-Record.

PURCHASING AGENT, 43, with 7 years experience in CPFF Procurement, Traffic and Expediting. Just completing contract, available short notice, desires position with future. PW-3701, Engineering News-Record.

HEAVY CONSTRUCTION Equipment consultant: Highly qualified British-Canadian engineer with many years experience in promotion use and sales of earth-moving, rock crushing and concrete machinery, desires appointment as consultant or to promote use and sales of leading manufacturer's products. Can also offer wide electrical experience. Speaks Spanish & French. Highest references American and foreign. PW-3802, Engineering News-Record.

GENERAL CONTRACTOR'S Supervisory organization. Capable of handling all phases of heavy construction in Architectural, Chemical, Electrical, Mechanical, and Structural Engineering. Three years in this field. Will be available soon. PW-3746, Engineering News-Record.

ELEC. ENG., BSEE, Reg. Prof. Engr. Age 30, married. Varied exp. Presently employed, consulting, planning and design of power, lighting and controls for bldg. and utilities, including specifications. Qualified for managerial status. Desire responsible position with opp. for advancement in progressive organization. Similar or divergent work as the opp. warrants. Western states preferred. PW-3742, Engineering News-Record.

CONST. ENGR.—20 yrs experience on all types of Construction—Airbases—Canals—Dams—Hospitals—Concrete Bldgs—Wood frame bldgs—office and field work—Masters Degree in Civil—Prefer foreign work—Just off a completed airbase contract—43 yrs old—Available stateside Nov. 5th. Write Box PW-3443, Engineering News-Record.

CIVIL ENGINEER, 15 years experience in both Architectural & highway-railroad, water & sanitary. Now employed as Chief of Party on heavy construction. Desires permanently located position. PW-3725, Engineering News-Record.

GENERAL SUPERINTENDENT. Over 25 yrs. heavy construction experience. Qualified to take full responsibility of projects of any type or size. Good background, know men and equipment, available any location immediately. PW-3806, Engineering News-Record.

CONTRACTORS ENGINEER. C. E. Grad. Reg. Prof. Engr. 20 years experience. 10 of which as Supt. of Const. Also experienced estimator. Know job pushing, equipment, cost control, etc. Experience about ¼ building—¾ heavy, job $2,000,000 big. Age 41. PW-3770, Engineering News-Record.

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OUR COURSES HAVE HELPED THOUSANDS
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Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

POSITIONS WANTED

PROJECT MANAGER — General Superintendent, 20 years field experience. All phases heavy construction—domestic and foreign. Able to set up, organize and run field end of entire job. Age 45. College trained. Available at once. PW-3595, Engineering News-Record.

CONSTRUCTION ENGINEER—B.S.C.E., Age 35. Experienced in field supervision on heavy construction projects, Dams, Atomic Energy Plant, Steam-Electric Power Plant, U.S. and Foreign. PW-3767, Engineering News-Record.

CONCRETE ENG'R., CE, PE. 6 yrs. with NYC concrete contractor; estimate; price; field supv; detail, design. 4 addtl. yrs. field, design, detail, purchase. Seeks opportunity anywhere. PW-3766, Engineering News-Record.

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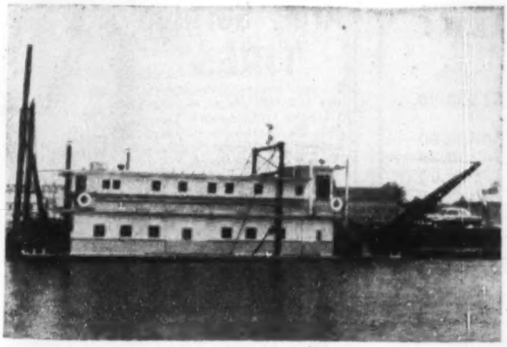

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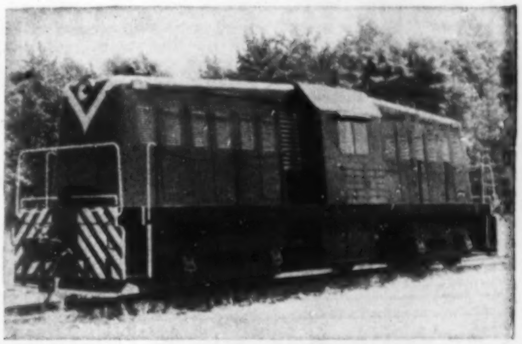

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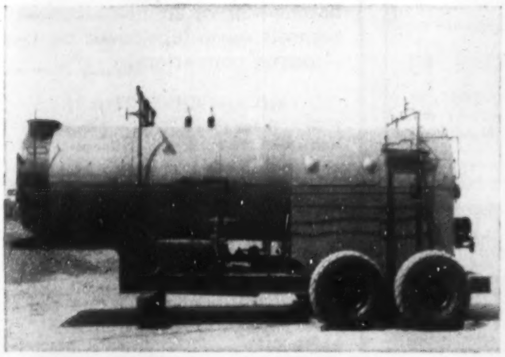

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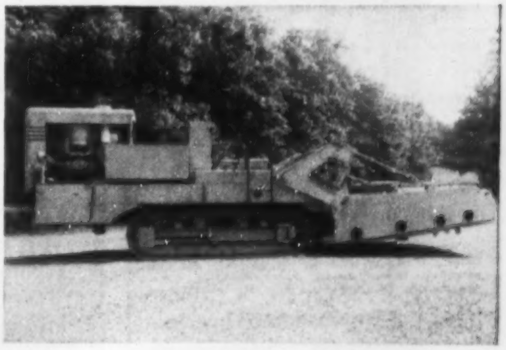

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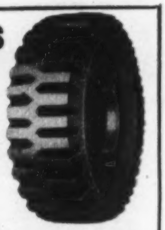

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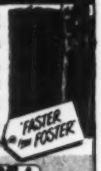

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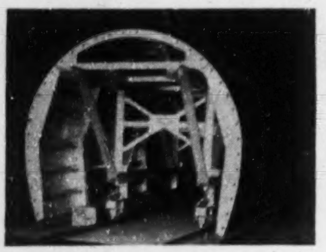

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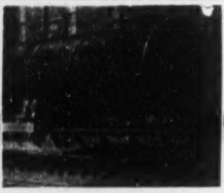

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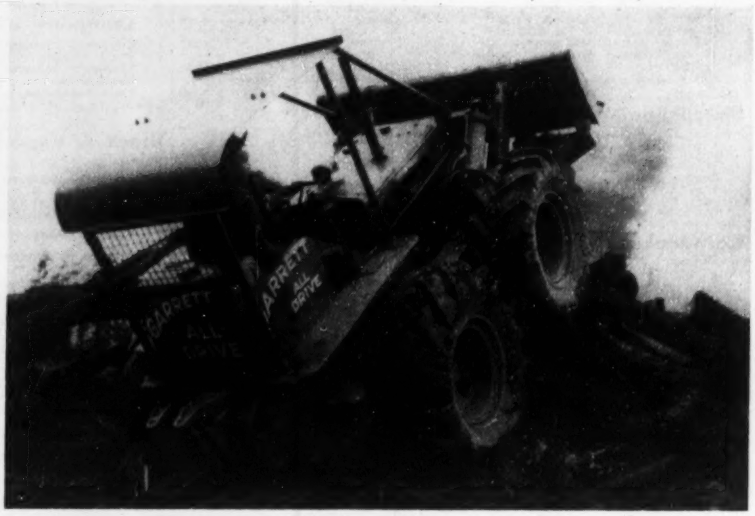


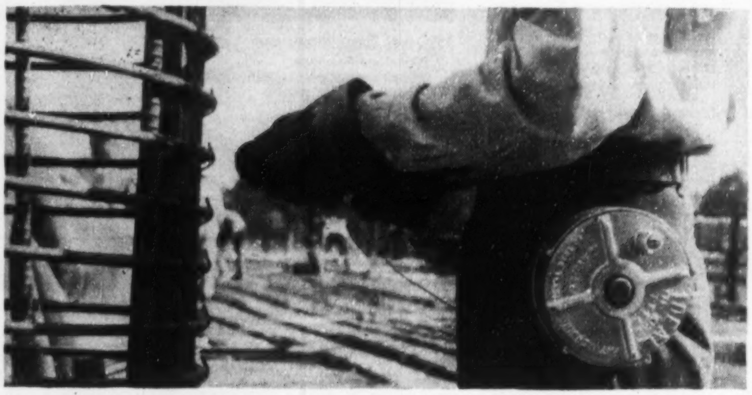
TD-6s converted to 4-wheel drives

In the new Garrett All-Drive, the speed and economy of a rubber-tired tractor are said to be combined with pulling power equal to that of a crawler through the use of 4-wheel drive. The new machine is a factory-approved conversion of an International TD-6.

It is in the 30 drawbar horsepower class and attains highway speeds of 8 mph. Eighty percent of the machine is assembled from standard International parts, including the motor, transmission, differential, steering clutches and final drives of a TD-6.

The ruggedness of the machine's construction can be guessed from its weight—13,060 lbs with winch, bulldozer blade and driver's canopy. This weight also makes unnecessary the use of counterweights, wheel weight, or fluid in tires to obtain traction on soft ground or slopes. Tires are the low-cost type used on farm tractors. GARRETT DIST., ENUMCLAW, WASH.

(*New Products continued on page* 138)



Reel reduces tie wire waste

Up to one-third more reinforcing ties with the same amount of wire is claimed with the use of the Ideal Reel. In addition, dangerous loose wires over the ironworker's shoulders are totally eliminated and efficiency is thereby increased. The reel weighs only 2 lb and is fastened at the worker's waist for either right or left-handed operation. The reel carries coils of 16 ga black annealed wire weighing 3½ to 4 lb specially produced for use with tie wire reels. It is constructed of aluminum with brass and steel used on wearing parts. The product is guaranteed by the manufacturer. Ideal Reel Co., 328 Harahan, Paducah, Ky.

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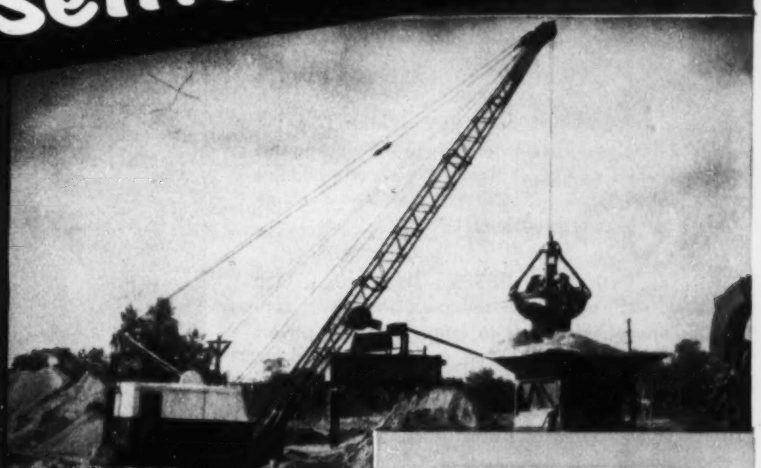
than a

MARION

43-M



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- A 1 cubic yard heavy-duty rock shovel.
- A 1 to 1½ cubic yard dragline.
- A 20-ton crane — boom lengths to 100 ft.
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- Fast, smooth, dependable MARION Air Control.
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21-SECOND batch time speeds airport and highway paving . .

Johnson Automatic Batch Plants, like the one shown here, accurately weigh out aggregates and cement ahead of heaviest paving schedules on highways, airports, and other large-volume concrete jobs. For example:

Keeps two 34-E pavers busy . . . One plant, with one batcher operator, easily supplies enough materials to keep two 34-E pavers busy full time. A 1¼-cu. yd. batch is weighed up, and discharged into truck, in as little as 21 seconds. One-stop charging of batch trucks speeds production. (Plant also can be arranged for two-stop charging.)

Automatic control maintains high plant output all day . . . assures pin-point weighing accuracy of every batch. A separate, fully-automatic weigh-batcher is used for each of the aggregates, and for the cement. All materials weigh up at the same time for greatest speed. These single-material Johnson batchers operate on electro-pneumatic control . . . fill valves and discharge gates are automatic air-ram operated.

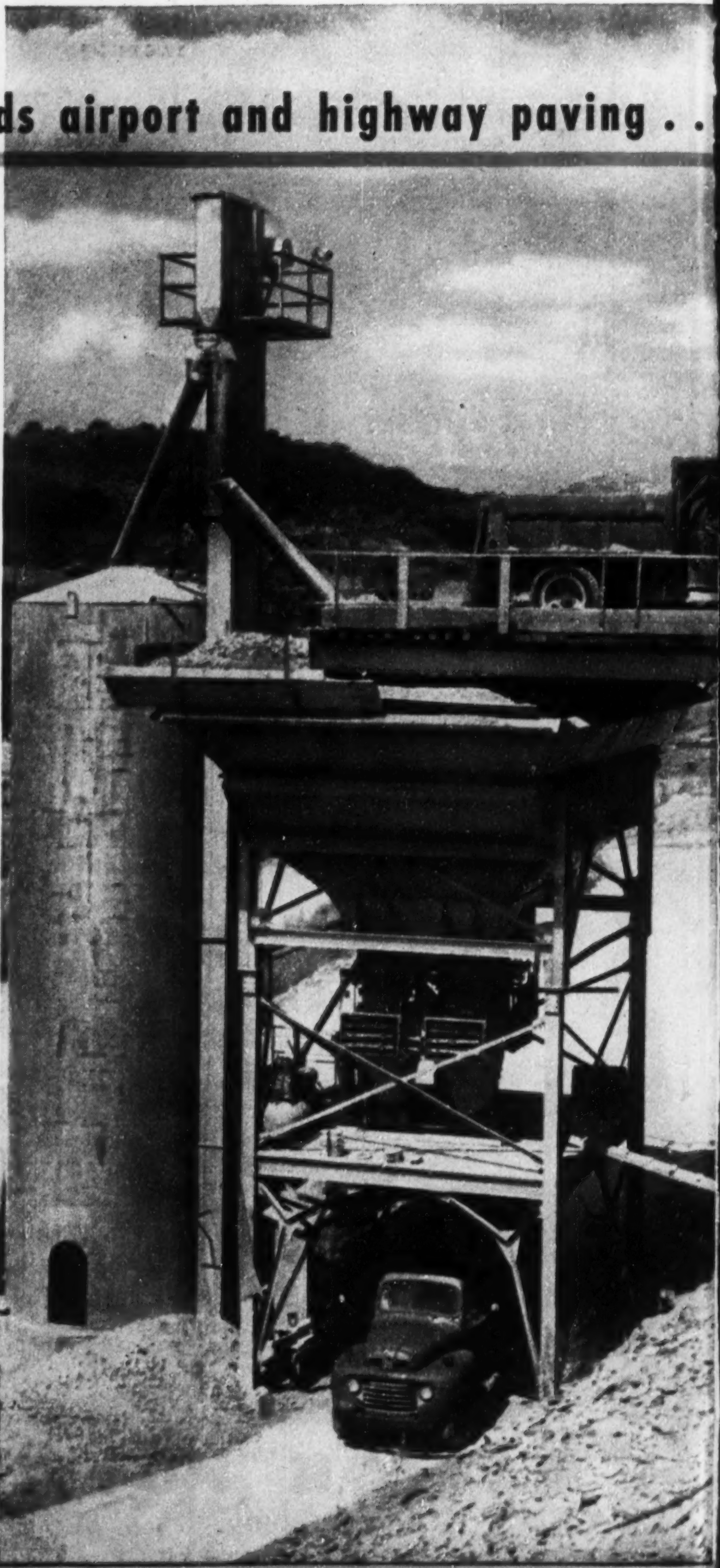
Multiple batch selections . . . For roadbuilder's use, dial scale with electric cut-off switch is usually used. When more than one batch size is required, single material batchers can be equipped with mix selector for 12 different mixes . . . all controlled from central operator's station. (Each of the single-material aggregate batchers can be equipped with a moisture compensating lever which automatically gives a dry weight of material being weighed.) Up to 120 mix selections are available on large Johnson batch plants for dams, and commercial ready-mix installations.

Investigate the possibilities of increasing concrete production on your operations with one of these Johnson Automatic Batch Plants. In many instances this equipment can be added to an existing plant. For complete details, contact your Johnson distributor, or write to us.

C. S. JOHNSON COMPANY
CHAMPAIGN, ILL. • *(Koehring Subsidiary)*

JOHNSON *automatic* BATCH PLANTS

CJ414



. one-man operation

Main units in this Johnson Automatic Batch Plant consist of: 150-cu. yd. square bin, with 3 aggregate compartments, and a 150-bbl. central cement compartment. Three 2000-lb. automatic single-material aggregate batchers . . . one 1000-lb. automatic cement batcher. Truck-receiving hopper, bucket elevator and 757-bbl. aerated silo for cement. Hillside ramp permits convenient truck delivery of aggregates to top of bin.

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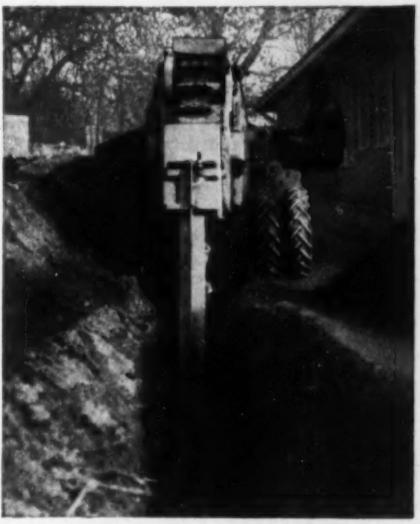
New features on Kwik-Mix 16-S Dandie®

Latest 16-S Dandie concrete mixer, interchangeable side or end discharge, has adjustable double-contact skip shaker, automatic water system, 3-point suspension mounting on heavy coil springs, cast steel drum heads with machined roller paths. Also, exclusive remixing action, and 8-second discharge with tilted Flow-Line Chute. Other models: 3½-S, 6-S, 11-S . . . bituminous, plaster-mortar mixers, power wheelbarrows.

KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)

14½-ft. per-min. Parsons Trenchmobile®



Rubber-tired Trenchmobile drives job-to-job at 12.6 m.p.h. . . . digs 8 to 16 in. wide, 5 ft. deep, up to 14½ ft. per min. Sloping ladder boom makes vertical set-ins, undercuts sidewalks, curbs, old mains. Other features: hinged crumber, "Tap-In" digging teeth, reversible conveyor, optional backfill blade. Also ask your Parsons distributor about the 2 wheel-type and 3 ladder-type Trenchliners® . . . all full crawler mounted.

PARSONS Co. • Newton, Iowa
(Koehring Subsidiary)

More work-time with Koehring Dumptor®

With more than a ton of strength for every ton of payload capacity, Koehring 6-yard Dumptor withstands severest loading shocks. Sides, end and double-strength bottom are heavily rib-reinforced. Stationary or free-swinging kick-out pan adds another ½" steel plate to heavy-duty bottom. Gravity dump eliminates body hoist maintenance. 1-second dumping speeds haul cycles. Also check Dumptor fast no-turn shuttle hauling.

KOEHRING Company
Milwaukee 16, Wis.

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9"

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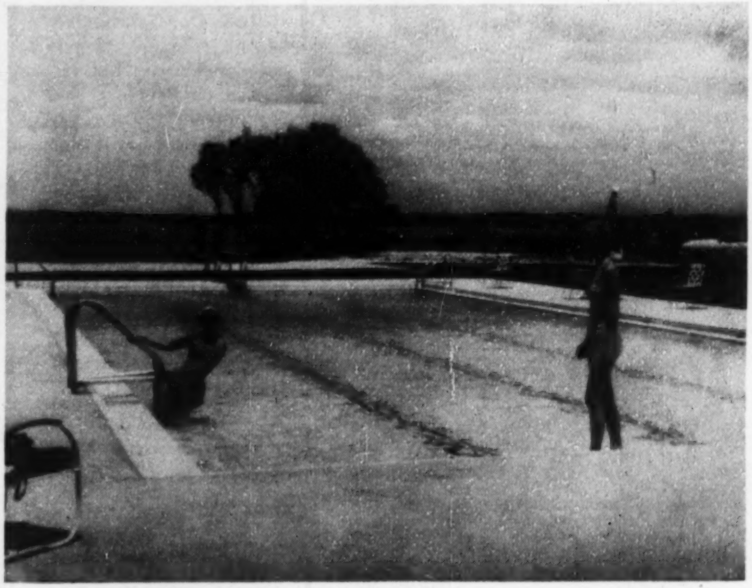


Steel swimming pools marketed

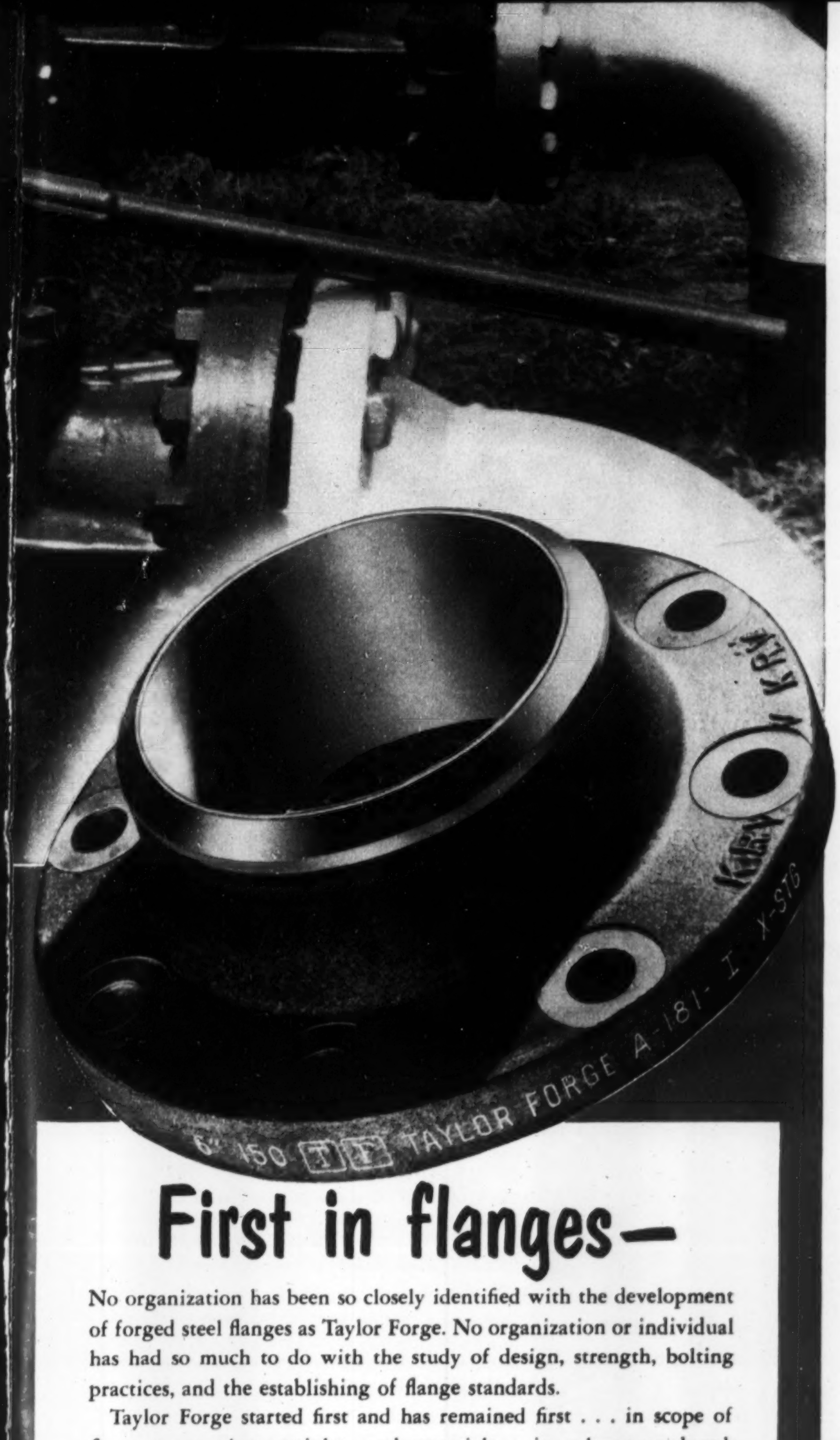
All-steel swimming pools are now being marketed in a range of four sizes. According to the manufacturer, development of the all-steel pool is the answer to a number of basic cost, construction and maintenance problems that have long been associated with the conventional swimming pool.

An all-welded steel panel construction, the product boasts many new features. For example, the pools are low-priced and constructed of corrosion and rust resistant, copper-bearing

(Continued on page 140)

New motor grader fills Adams line

Model 330 with a 75 hp International diesel engine is the fourth in a line of newly redesigned Adams graders. The 330 follows the 140-hp 660, the 115-hp 550 and 85-hp 440 and like them features a constant-mesh transmission that delivers eight forward speeds up to 25 mph and four reverse speeds up to 13 mph. Optional creeper gears provide ¼ to 1¾ mph speeds. Other optional equipment available includes power-shifted moldboard, bulldozer, scarifier and snow removal equipment. Standard blade length is 12 ft; weight without additional equipment is 20,500 lb. J. D. Adams Mfg. Co., Indianapolis 6, Ind.



First in flanges—

No organization has been so closely identified with the development of forged steel flanges as Taylor Forge. No organization or individual has had so much to do with the study of design, strength, bolting practices, and the establishing of flange standards.

Taylor Forge started first and has remained first . . . in scope of flange types, sizes, weights, and materials . . . in volume produced.

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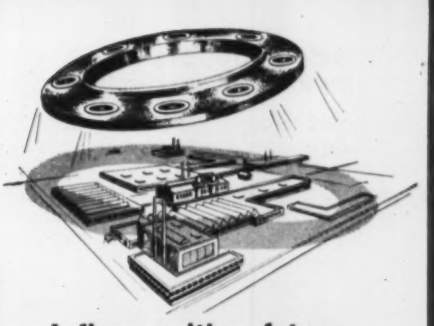

A flange with a future—

Even though no one knew it at the time, the year 1905 was a significant year for Taylor Forge.

It was the year that Taylor Forge began the making of forged steel flanges.

The beginning was modest enough. Taylor Forge simply started out to make flanges for Taylor Spiral Pipe because the only flanges then available — cast iron flanges—had proved unsatisfactory. But it was soon apparent that the men at Taylor Forge had built better than they knew. In just a few years, the new and stronger Taylor Forge Flanges were in demand everywhere—not just for Taylor pipe, but for all types of pipe used by U. S. industry.

It was also apparent that the forging of flanges had taken Taylor Forge into the dawning field of designed piping. Pressures were beginning to climb. Knowledge of how to contain them was needed. By 1920, the late J. Hall Taylor and his associates began the intensive research that was to make Taylor Forge not only the world's largest manufacturer of forged steel flanges, but also the foremost contributor to flange design and standards.

In the mid-20's, big strides were made in flange development to meet the broadened needs of the growing petroleum industry. By 1927, as the reward of long, intensive research, the authoritative Taylor-Waters formula was published. This research work demonstrated the design advantages of the hub type flange and provided the means for producing flanges accurately proportioned for strength combined with economy.

Most of this research had been concerned with the American Standards—flange sizes through 24"—but in 1938 Taylor Forge published the first edition of its widely consulted "Modern Flange Design," based on methods proposed by E. O. Waters, D. B. Rossheim, D. B. Wesstrom and F. S. G. Williams, manager engineering standards, Taylor Forge (ASME Trans. Apr. 1937). It provided the first complete analyses of the effects of tapered hubs on flange strength and thus opened the way to predetermine design requirements of flanges of all types.

(An episode in the story of Taylor Forge leadership in designed piping)

MODERN FLANGE DESIGN
TAYLOR FORGE & PIPE WORKS

Forty years of research made this book possible. It is available to those interested in flange design.

steel throughout. Paint requirements are reportedly reduced to an occasional coat of paint only, and the pools are leak and seep proof when installed. Frost action and other problems are said to be obviated by the design and construction.

Simply described, the all-steel pools, now being fabricated and installed by the manufacturer, have bottom and side plates designed for simple assembly in the field. The sections of steel are designed for easy adjustment as to level and line. Except for small splash and evaporation losses, the pool needs to be filled but once, since each unit is designed to be adapted to filtering and re-circulating purification systems.

Pools of four standard dimensions are now available in sizes ranging from 33-ft lengths by 16 ft wide to the 105-ft "Olympic" size pool, which measures 35 ft wide. Special dimensions, of course, can be constructed to meet individual or group requirements. While individual panels or sections are welded together at the construction site, the pools are designed for quick assembly. This is attained primarily by keeping the weight of the individual sections to a maximum of a ton or less. With members set in place, positions are provided to support splash drains and to provide a method of placing the top edge of the pool level and straight. The sides and ends of this design attach to the bottom plates for proper positioning and added strength. AMERICAN BRIDGE DIV., U. S. STEEL CORP., 71 BROADWAY, NEW YORK 6, N. Y.

Acoustical ceiling panels have random perforations

The range of design possibilities presented by the sound control products of the Owens-Corning Fiberglas Corporation has been further expanded by addition of a perforated acoustical ceiling tile in a random pattern.

In the tile, the perforations that trap noise are in an irregular, scattered pattern, in contrast to the straight line arrangement of the holes as found in other perforated acoustical tile.

Addition of the random design permits a choice between a clean, sharp ceiling pattern and a softer one in installations where a perforated tile is preferred.

Fiberglas Random Perforated Acoustical Tile is available in 12 x 12 and 12 x 24 in. sizes. Its painted surface is reported washable and can be repainted as frequently as desired. In addition to its noise reduction efficiency it is said to be firesafe, dimensionally stable and light in weight. OWENS-CORNING FIBERGLAS CORP., TOLEDO 1, OHIO.

(*New Products continued on page 143*)

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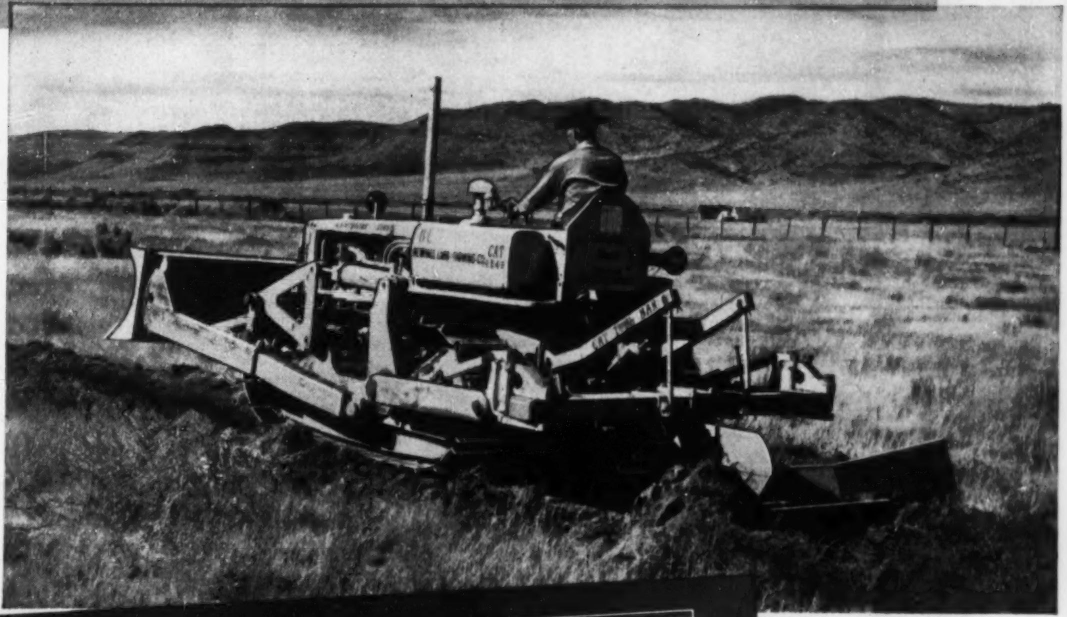
CLEVELAND 11, OHIO

"Caterpillar" No. 41 Hydraulic Control imparts increased versatility to "Caterpillar" D2 and D4 Diesel Tractors. Here a D4 Tractor and tool bar with ditcher attachment is making irrigation ditches.



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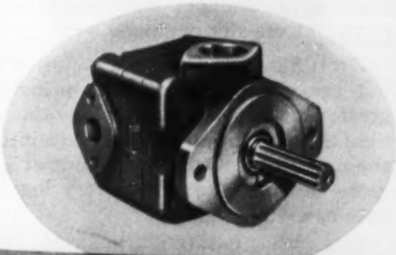
"Caterpillar" selected the Vickers Pump (shown below) for the source of power in the No. 41 Hydraulic Control because of its outstanding performance . . . performance that results from several exclusive features. This Vickers Pump is vane type, hydraulically balanced and has automatic wear compensation. This means that it delivers more oil while taking less power from the engine . . . that it has a much longer life with minimum maintenance . . . and that it insures dependability and easier cold weather starting of the tractor. A Vickers Pump is the mark of high quality in hydraulic power controls.

This is the Vickers Pump used in the "Caterpillar" No. 41 Hydraulic Control. Hydraulic systems on tractors and other farm equipment use more Vickers Pumps than any other make.



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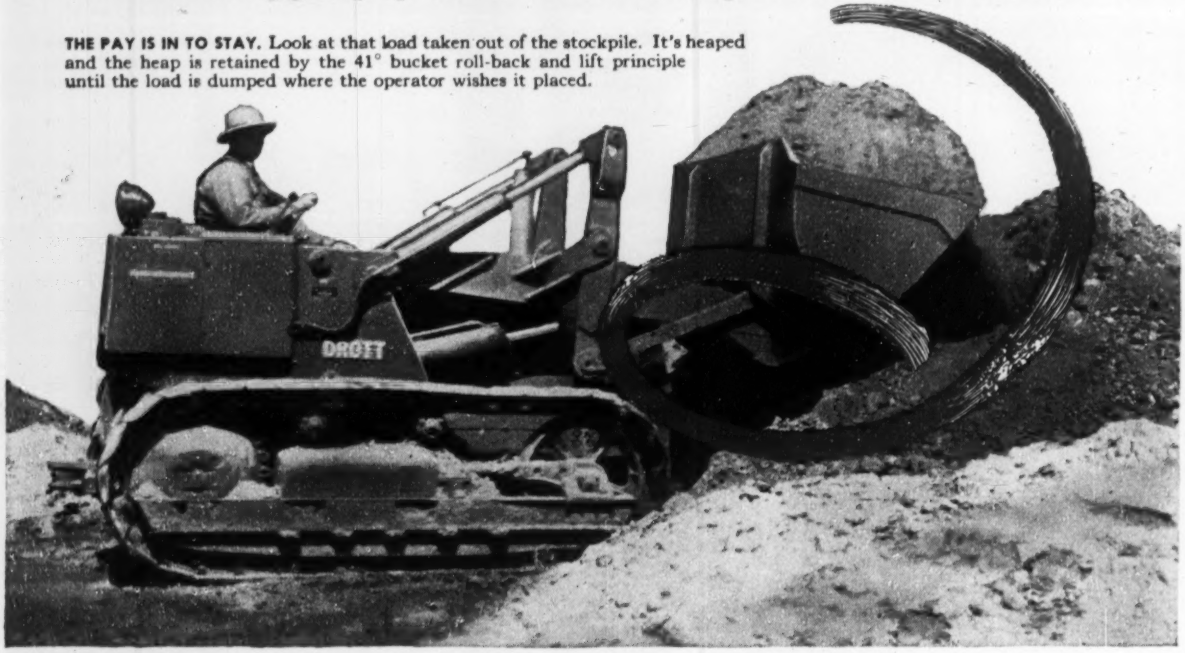
Exclusive Drott Skid Shoes are the big reason why INTERNATIONAL crawlers with Drott Skid Shovels deliver 300% greater digging force, bigger payloads, faster transport than all others!

THE PAY IS IN TO STAY. Look at that load taken out of the stockpile. It's heaped and the heap is retained by the 41° bucket roll-back and lift principle until the load is dumped where the operator wishes it placed.



Big news in the front-end loader industry today is the amazing performance of the new leader in loaders—INTERNATIONAL crawler equipped with Drott Skid Shovels.

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The Hydro-Spring is still another Drott exclusive—absorbing 70% of the shocks normally encountered in front-end loaders to extend equipment life and make operating far easier.

Skid Shovels come in four sizes—7/8, 1 1/4, 2 and 3 cu. yd. buckets for the INTERNATIONAL TD-6, TD-9, TD-14A and TD-18A. You can get an eye-opening demonstration of the model suited to your needs by simply calling your INTERNATIONAL Industrial Power Distributor today.

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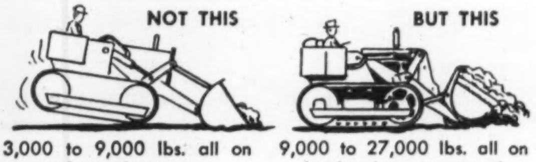
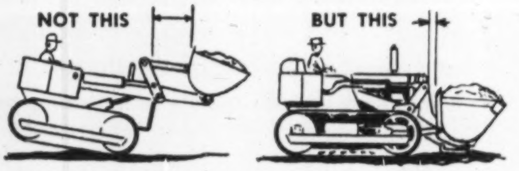


3,000 to 9,000 lbs. all on front of tractor

9,000 to 27,000 lbs. all on loader shoes on ground

SKID SHOE TRANSPORTATION



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INTERNATIONAL DROTT

Portable hoisting-pulling unit weighs only 42 lbs

The Tirfor Griphoist is a lightweight unit that enables workmen to haul and hoist heavy objects to any distance or height—cable travel is unlimited.

The mechanical principal used is a combination of crank, cam and lever. The hoisting cable passes through the machine and does not reel or spool inside. Two pairs of steel jaws alternately grip and pull then slide back for the next gripping and pulling cycle.

To operate, the clutch is opened and the cable introduced through a guide bushing—at bottom in picture—slack is then taken up and the clutch closed. A safety factor in the design keeps the clutch locked as soon as a load is applied thus preventing load from dropping while cable is under tension. A telescope handle is furnished to aid in lifting and lowering.

One complete push-pull motion of the handle will pull or release the cable about 2¾ in. At the nominal load of 3,300 lb, a cable travel of about 10 fpm can be obtained. Loads of 10 tons can be lifted by using multiplying sheaves.

The unit can be used in any position and follows the load without fairleads. On a vertical lift, by mounting a pulley or snatch block overhead and securing the machine to a suitable anchor on the ground, the operator can select the most favorable position to work.

The machine weighs 42 lb and measures 2 x 1 ft. Standard ½-in. wire rope in any length—usually 60 ft—is used. A light metal reel, supplied with the wire rope facilitates its winding up and transportation. GRIPHOIST, INC., 544 MARKET ST., SAN FRANCISCO, 4, CALIF.

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EDITORIALS

Money for railroad modernization

Announcement by the Nashville, Chattanooga & St. Louis Ry. that it is releasing 43 acres in the heart of Nashville, Tenn., for redevelopment must be welcome news for that city. The area has been occupied by an antiquated freight yard, which now has been replaced by a modern one outside the city. But this announcement also should have significance for many other communities burdened by similar old freight yards, team tracks, freight houses and passenger stations that were built back in the days when horse-drawn vehicles limited the distance that goods and people could be moved conveniently over city streets.

What has been done in Nashville can be done in varying degrees in hundreds of towns and cities, if the railroads could command the capital needed to modernize their terminal facilities. Their trouble is that most of them cannot obtain the needed new money because the freight rates they can charge are fixed by the Interstate Commerce Commission under legislation passed back in the days when railroads had a monopoly on mass transportation. That law is as antiquated as the facilities that still burden the railroads and most of the communities they serve.

Some way should be found to impress this fact on Congress and the President's economic advisors. The potential new construction that would be created by giving the railroads enough income to attract new capital would run into many billions of dollars. Also, numberless cities would have blighted areas released for redevelopment.

New trend in prestressing

A significant change appears to be taking place in the methods used by U. S. contractors for prestressing concrete beams. Until the end of last year, nearly all prestressed beams were fabricated in place by post-tensioning, the prestress being transferred from the steel tendons to the concrete by end anchors. Since then, according to an ENR survey, there has been a marked increase in pretensioning, a method that requires the placing of concrete in the beam forms after the tendons are stressed and the later transfer of prestress to the concrete by bond.

Pretensioning is essentially an off-the-site precasting operation because it requires that the beams be cast between heavy anchors that hold tension in the tendons until the concrete has attained the required strength.

Pretensioning has several characteristics that U. S. engineers dislike, which led them to ignore it at first: (1) The heavy anchorages that have to be built for the jacks to act against are costly. Hence, there must be a considerable amount of prestressing demand to justify the cost. (2) Since the prestress is transferred by bond, tendons have to be small-diameter wires or strands, requiring more man-hours for placing and stressing than when large-diameter tendons can be used. (3) The method favors fabrication in a specially equipped plant, which tends to make long or heavy members uneconomical, or even impractical. (4) Loss of prestress due to shrinkage is larger than for post-tensioned beams and its magnitude may be difficult to predict with accuracy.

In contrast, post-tensioned beams not only lack these undesirable features but have the advantage that tendons can be draped in a vertical curve, thus improving the economy of prestressing by providing uplift forces as well as longitudinal compression. But the end anchorages are expensive.

When there was a shortage of structural steel, engineers resorted to prestressed concrete as a substitute in a great many cases. Now, prestressed concrete has to compete with steel on a price basis. So there is more incentive to try new methods to cut costs. As a result, fabricators are setting up permanent plants for pretensioning, seeking to combine the advantages of mass-production precasting with those of prestressing to meet competition (ENR Jan. 7, p. 116). Two examples of this trend were reported in ENR Aug. 19, p. 32, and Aug. 26, p. 36.

It is too soon to attempt to predict where this new trend may lead. If it leads to more efficient construction techniques or to designs that are skillfully worked-out combinations of pretensioning and post-tensioning, then the competitive position of prestressed concrete as against steel construction might be materially improved.

Making dreams come true

Ever since the day when scientists realized the vast amount of power that is locked in the atom, some of them have dreamed of another day when that power could be released to provide man with useful electric energy in areas far removed from normal sources of fuel with which to generate electric power. Now that day appears to be just around the corner. The Corps of Engineers has started to build an atomic power plant at its engineering center at Ft. Belvoir, Va. It is to be constructed of sectional units of a size that can be flown to any part of the world for reassembly into a power plant of 1,700-kw capacity (ENR Aug. 26, p. 23).

The fact that this first transportable atomic power plant will cost over $2,000 per kilowatt of power produced is of no consequence now. What is needed is experience in the actual construction and operation of such a plant.

Low-cost atomic power for regions remote from fuel sources may still be a long way off; on the other hand, it could be much nearer than anyone realizes today. Certainly the experimental plant to be built at Ft. Belvoir should help in bringing realization nearer.

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